

MAY
1915

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CENTS

MOTOR BOATING



In This Issue
Handicapping & Restricted Class Racing



Seaworthy,
Speedy,
Simple,
Safe

36 foot ELCO Express



30 foot ELCO Express
36 foot ELCO Express
32 foot ELCO Cruisette
33 foot ELCO Cruiser
45 foot ELCO Cruiser

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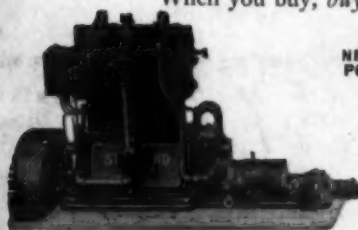
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The engine you are considering *may* be all right, but why take chances when Buffalos cost no more than other good engines?

Shall we send you the new Buffalo Book which is just out?

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ELBERT HUBBARD.

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As a matter of fact, many of the country's most prominent naval architects and boat builders have recently visited our plant. Emissaries from the U. S. and foreign governments have been here. The latch-string is out to every visitor.

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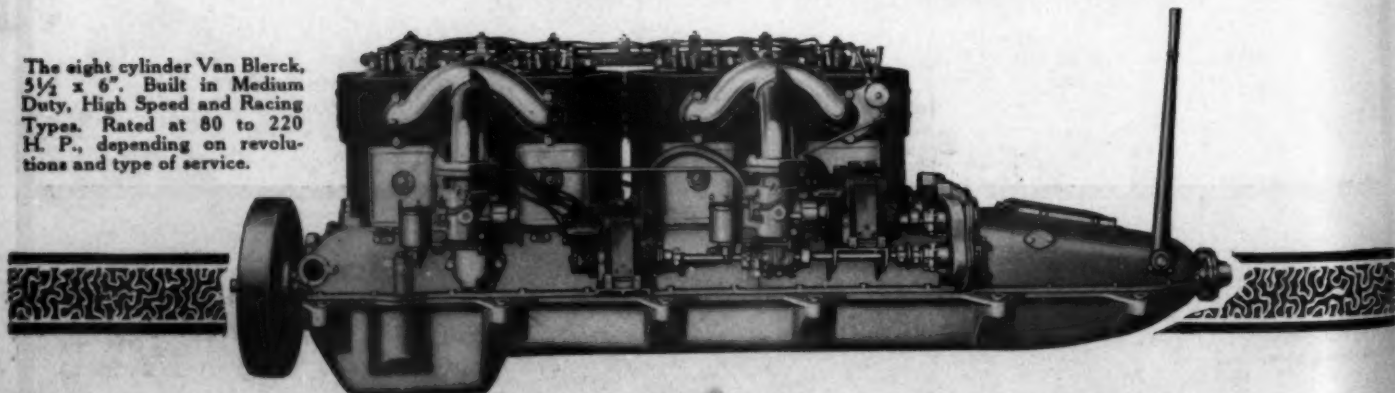
Let us put you on the list for the Van Blerck Bulletins.

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— MONROE, MICHIGAN —

The eight cylinder Van Blerck, $5\frac{1}{2} \times 6"$. Built in Medium Duty, High Speed and Racing Types. Rated at 80 to 220 H. P., depending on revolutions and type of service.



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MOTOR BOATING

WE take a great deal of pride in the confidence which Mr. Wm. H. Hand, Jr., of New Bedford, Mass., has placed in Loew-Victor Engines.

In his own particular line, Mr. Hand is undoubtedly one of the most successful naval architects in the country. The originator of the Hand V-bottom type, he is an authority on all matters marine, and builders of Hand boats have generally been pretty careful in following his suggestions as to power equipment.

The combination of Hand V-Bottom boats and the Loew-Victor Engines has been one of the outstanding successes of the past few seasons. Literally hundreds of Hand V-Bottom boats throughout the world have been equipped with Loew-Victor Engines and have given their owners splendid satisfaction.

Mr. Hand uses Loew-Victor engines in his own boats for his personal use. "Piute IV" is a 28 ft. 6 in. by 7 ft. 2 in. typical Hand V-Bottom that drives along at 22 M.P.H. with her six-cylinder Model 14 Loew-Victor, no matter how rough it may be—a real sea boat—yet remarkably fast.

Another splendid success is Mr. Hand's new 20-footer "Skilligallee" that he guarantees to do better than 21 M. P. H. with a Model 30 Loew-Victor. This is the first time that a boat as seaworthy and as roomy as this one, could be driven at over 21 M. P. H. with so small and economical a power plant as the 20 H. P. Loew-Victor. To use Mr. Hand's own words "The motor runs beautifully, and 'Skilligallee' is, I believe, the fastest wholesome 20-footer in use to-day with a motor of this size and weight."



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A 30-ft. cruiser designed by Mr. Wm. H. Hand, Jr., built by A. E. Raymond & Co., Ft. Myers, Fla. Speed 15½ M.P.H. with a four-cylinder Model 13 Loew-Victor installed.

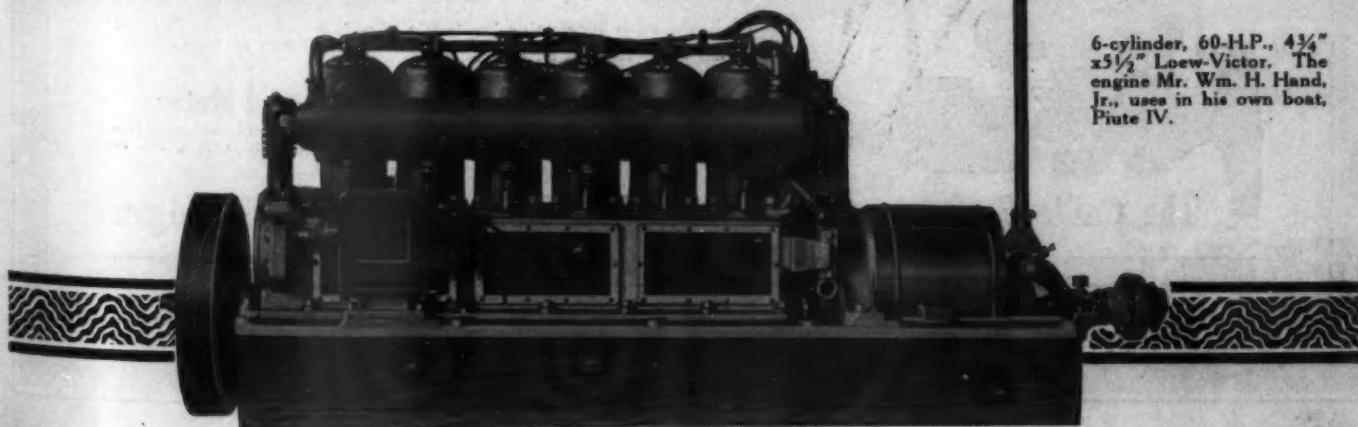
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This Is "Silver Heels" Winner of 9 Firsts in 9 Entries



Silver Heels is a 16-foot hydroplane. She was designed by Eli Townsend, a naval architect whose fame ranks with that of Nathaniel Herreshoff, Wm. Gardner, H. J. Gielow, Murray Watts, M. M. Whitaker and others of equal prominence. She is owned by Arthur Gilmore, a 16 year old lad of Stone Harbor, N. J. Contrary to expectations, her power plant is not a big, powerful, high-priced motor, but a Caille 8 H.P. Unit Plant—a motor selling for \$150.00 complete.

In tryouts, Silver Heels proved so speedy that Master Gilmore decided to enter her in nine leading Jersey coast races. She won every entry. And, mind you, in each race she was operated by her owner, a lad of sixteen, and his chum, a boy of fourteen.

We Bought the \$1000 "Silver Heels" Plans—Now We Offer You a Set FREE

We bought these plans because we realized that here was a most remarkable harmonious combination of motor and boat. We realized that thousands of people everywhere just long for such an outfit. But everybody can't afford the services of such an expert designer as Eli Townsend. And yet, to secure such a perfect combination of motor and boat involves certain scientific rules and principles known only to expert naval architects. So, in order that our customers desiring such a boat may get the maximum efficiency out of their motor, we are going to offer a set of "Silver Heels" plans with every Caille 8 H. P. Unit Power Plant absolutely free.

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\$150

Just like the motor in "Silver Heels"

8 H.P.
Caille
Unit
Power
Plant

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This book also shows our complete line from 2 to 30 H.P.—one to four cylinders—standard and heavy duty types. Don't do yourself the injustice of buying before seeing this book. A postal brings it.

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The only motor having the 5 Speed Features, Push-Button Control and embodying all features of merit found in all other outboard motors combined. Catalog No. 10 sent on request.

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Mr. Eli Townsend, the famous Naval Architect and Boat Builder. Designer of "Silver Heels."

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May, 1915

**MOTOR
BOATING**

Vol. XV. No. 5

THE NATIONAL MAGAZINE OF MOTOR BOATING

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The pleasures of inland motor boating differ from but are no less enjoyable than those of offshore cruising. Denied the splendor and immensity of the open waters, we are fully requited by the ever-changing panorama and the luxuriance of waterfront vegetation. The problems of navigation, too, are different, and on our lakes a memory for snags and boulders is of greater value than the finest compass or barometer.



The Future of Restricted Class Racing.

The Great Possibilities Which Appear to Be Ahead of This Kind of Racing.
Classes Which Have Proven Successful and What Their Restrictions Are.

THAT very important question as to how motor boats should be raced together will probably never be settled to the satisfaction of everyone. There are so many different conditions entering in and so many different angles from which the subject may be attacked that one is discouraged even before he makes a real start. However, there seem to be two main and logical divisions to the question, and all of its subdivisions should properly fall into one or the other of these divisions.

First we must satisfy ourselves as to whether handicap races or scratch races will bring the greatest results from every standpoint, and furthermore we must consider how to race together the boats which are already in existence, actually built, and in use, and also how to match the boats of to-day with those of to-morrow. Obviously each division has, not only its advocates, but many points in its favor as well.

If we decide that the handicap method is the best, everything considered, then quite aside from the question as to what handicapping rules we should adopt, is the problem of what the fundamental object of a handicapping rule should be. Racing together the boats which we actually have is one thing, but separate and distinct from this is the question as to whether we should promote racing from a social or

The subject of restricted class racing is a very broad one, and one which we believe is as yet undeveloped. Great success has resulted from this kind of racing in England and on the Mississippi River. The subject is too large to treat conclusively in one article, but we are giving complete data on page 36 of all American motors suitable for such racing and the classes as they exist at present.

MoToR BoATinG will be pleased to receive any suggestions from its readers as to their ideas of the most suitable classes and their opinion of the restrictions. If desired, these will be presented to the A. P. B. A. authorities for their guidance in formulating new restricted classes this fall.—Editor.

scientific standpoint, that is, should we just have a jolly good time together or should we put a premium on "brains" in the broad sense.

Unfortunately these two characteristics are antagonistic. Such a combination of affairs as a jolly good time and scientific development is very rare. If we care for only the former, then such races as the "bang and go back," the trial performance, the consistency test, drawing a number out of a hat in order to pick the winner, getting one's handicap over a portion of the course unbeknown to the contestant, forbidding the use of a time piece in the boat, etc., etc., are all good fun, but further than that

what do they show? Absolutely nothing.

Yet on the other hand, from a scientific standpoint, let us see what we are up against. Is it fair to the man who owns a three or four year old boat to be pitted against one of the present day or even a year old? In the two latter cases, we have the benefits of several years of experience in hull and engine design and everyone knows that changes are being made every year that are most important. And again the latter boats and power plants have not been subjected to several years of wear and depreciation. Should not some weight be given such in an instance to the various obsolete factors in order to revive interest among the owners of the older boats—craft which are



Two of the international 21'-class boats racing at Monaco. These boats, with a maximum of 151 cubic inches piston displacement, obtain speeds in some instances as high as 40 miles an hour.



Ugly Duckling II, one of the most successful boats ever built for Class A, of the M. V. P. B. A., limited to 224 cubic inches piston displacement for 2-cycle motors. This boat was powered with a Pierce-Budd 2-cycle motor, having a piston displacement of 201 cubic inches, and was capable of a speed of 28 miles an hour.

worthy in every sense of the word, yet a trifle out of date to compete on even terms with the modern racer.

Another possible solution might be to devise a combination of the scientific treatment with the trial performance, giving each due consideration in arriving at the answer. But what is the answer? No one has yet been able to tell us with any degree of satisfaction, although an answer might be forthcoming if motor boat racing were more universally indulged in, and perhaps we might say better managed and supervised, so that it would be possible to collect accurate data on the subject which is not available at the present time.

It therefore appears that handicap racing will always be more or less unsatisfactory among certain classes of boats on account of the many different and uncertain elements entering into the problem of calculating what the handicaps should be based upon. Until these uncertain elements are removed, to a large extent at least, we must not expect to see perfection reached. It is a long jump from the present condition of things to an ideal state and there are sure to be many obstacles and hurdles in the path. The other main division which we have mentioned above, and the one which appears to have by far the greatest possibilities in this field, is the "boat for boat" racing. For some unknown reason this

A Whitaker Whizzer, a boat very similar to those adopted for the new 999 class. With this particular boat a speed of 21 miles an hour was possible with a 4-cycle Loew-Victor motor, having a piston displacement of 221 cubic inches. This boat is 21' long and about 5' beam, and weighs 1550 pounds without crew.

method of racing has received the least amount of attention in this country up to the present time, although it has proven very successful abroad in many instances. It is very apparent that any "boat for boat" scheme that might be devised must be a suggestion for the future. An effort to segregate the heterogeneous mass of floating craft as it exists today into any satisfactory arrangement of classes could hardly be expected. We must plan for the future and then build to the classes decided upon if we wish any degree of success to result. Furthermore, we should not be hasty in our conclusions but we should build them upon a sound basis and then let them stand unchanged for several years at least.

Like the handicap proposition we find ourselves confronted with a number of conditions which we must fairly consider before we can reach any definite conclusion. In the first place, are we to decide on one-design classes or will restricted classes work out better? If the latter is chosen are we to put limits on length, weight, or piston displacement or a combination of two or more of these?

One design classes have several objections which it is hard to overcome, the principal one being that, inasmuch as the boats and power plants must necessarily be all alike, that after the final competition between naval architects for the acceptance of the design of the hull and between the engine builders for the choice of power plant is over, there is nothing more to stimulate progress in this particular class. When this point has been reached it is entirely up to the owner who drives the boat or his mechanic who runs the motor to get the last notch out



Amorita, a 25-foot displacement boat, with a 300 cubic inch displacement motor, weighing 2900 pounds, without crew. This boat is capable of between 21 and 23 miles an hour.



Warren-Groat, a 30-foot hydroplane, with a 4-cycle motor, having a piston displacement of 450 cubic inches, and driving the boat 30 miles an hour.

Bull Moose II, a 32-miler, with a 2-cycle motor, of 478 cubic inches piston displacement.

Xqqme, a 25-foot displacement racer, weighing 2240 lbs., without crew, and capable of a speed of 25½ miles an hour with a 4-cycle motor, of 571 cubic inches piston displacement.

of the outfit. After this has been done there is little more necessary than to sit and look wise, wondering all the time why the other fellow had such an easy time in beating you. Of course, there are many details of maintenance, trim, etc., which enter into the problem, but, after all, there is hardly enough of the personal equation present in this kind of motor boat racing to make it a success. We simply have so many machines, exactly alike, competing, sort of clock fashion, with each other.

To be successful from a racing standpoint the boats must be of a popular type to strike the fancy of their owners or prospective owners, and aside from this they should be useful for other purposes than mere racing. The tendency should be away from anything which resembles a freak either in hull design or power plant.

In several instances one-design classes have been formed with more or less success for a year or two, but after that interest in them seemed to die out and the class had to be abandoned as a failure. The

latest one-design class to appear is the new "999" class which has recently been adopted by the Motor Boat Club of America. The hulls are designed by Whitaker, built by Peterson and are powered with a 4-cylinder, 4-cycle Loew-Victor motor of about 25 h.p. From every indication it appears that this class should be a real success, and some ten or twelve of these boats have been ordered. A speed of 25 miles an hour is expected and the total cost of the completed boat is \$999.

We have thus far briefly touched on handicap racing in its various phases, and also scratch racing among the one-design boats. By a process of elimination, we see why none of these are ideal and why the greatest possibilities seem to await the development of a proper arrangement of restricted classes. None of the arguments against handicap and one-design classes are applicable against the restricted class and in addition there are a great many arguments in its favor.

Perhaps the first point in its favor which will occur to

(Continued on page 50)

A. F. B. II, a 17-foot hydroplane, weighing 1941 lbs., without crew, capable of a speed of 28½ miles an hour, with a motor of 571 cubic inches piston displacement.



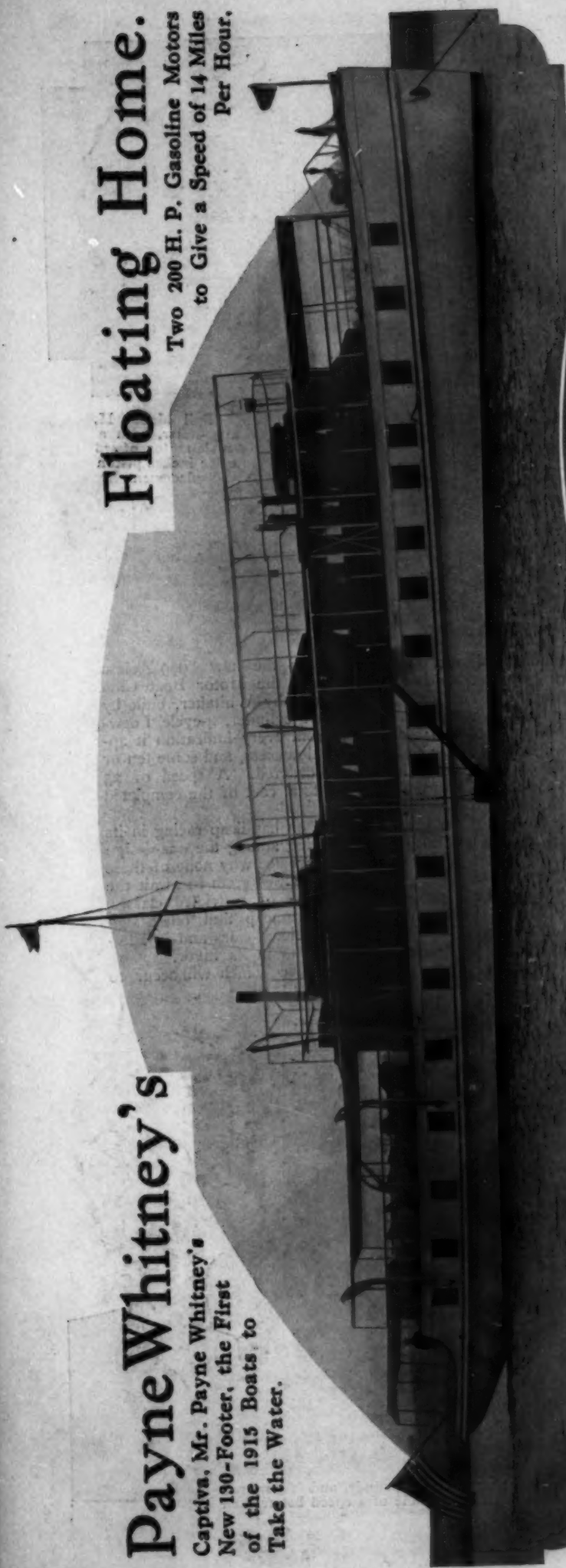
Tech, Jr., representing a boat of the extreme speed type. This boat weighs 3445 pounds, and is powered with an 8-cylinder motor, of 1283 cubic inches piston displacement, and is capable of a speed better than 40 miles an hour.

Payne Whitney's

Captiva, Mr. Payne Whitney's
New 130-Footer, the First
of the 1915 Boats to
Take the Water.

Floating Home.

Two 200 H. P. Gasoline Motors
to Give a Speed of 14 Miles
Per Hour.



A view of Captiva at anchor, giving one an idea of the size of this motor yacht.

The dining saloon
in the deck house.



A view of the after deck looking forward.

The illustrations on these pages show the first City. Two 200 h.p. Winton motors will give Captiva a cruising speed of 14 miles per hour and she has sufficient fuel capacity for a cruise of several thousand miles. The equipment is complete in every detail.

and a range of equipment is complete in every way
was designed by Messrs. Gielow & Orr, of New York.



The two 200 h.p. Winton gasoline motors.



The owner's private stateroom.



Captiva has a total of three decks and this is a view of the upper deck looking forward. Protection from the elements will be given by a large canvas awning.



Mrs. Payne Whitney's stateroom.



Living room looking aft.
Photographs by Leick.



MARINE MOTORS

AS it would take several articles to embody even a limited description of the ideal marine motor, we shall in this article confine ourselves to the type and proportions. There will be no attempt to treat in a technical manner any of the subjects taken up, and, on the other hand, there will not be a description of the principles and differences between two- and four-cycle engines and what constitutes a make and break or a jump spark. While the above is always interesting to the beginner, it is very stale reading to the great mass of boat owners who have owned and operated boats for years and know by actual experience about mixtures, short-circuits, carbureters, two- and four-cycle, etc. A treatise on the physical properties of steel, the conversion of reciprocal forces into rotary effect, or that the contents of a sphere are $\frac{4}{3}\pi r^3$ are not in order.

However, it appears opportune at this time to present and illustrate an ideal motor and give the reason for the adoption of the several features.

The type of the ideal motor first depends on the service, and the two-cycle is best suited for small pleasure craft and every-day fishing and workboats of limited size; while the four-cycle is adapted to the larger class of pleasure and business boats. These are divided by builders into light, medium and heavy-duty engines. As the light engines are mostly special and the heavy-duty limited in numbers, we will confine ourselves to the predominating medium-duty four-cycle type of popular size, such as could be used in a cruiser or fast runabout. Before we start on our engine, we will canvass the field of the above cruiser and runabout classes, that we may arrive at a size having a reasonable range in the greatest number of popular size hulls. We get out our files of *MoToR BOATING* and conclude finally that the greatest number of cruisers are from 25 to 36 feet long, and the runabouts 25 to

30 feet in length. These represent the greatest number of the better class of motor boats. In this day of high pressure we must provide for a reasonable power in our cruisers, say, 16 h.p., at 400 r.p.m. in the 25-foot, 20 h.p. at 500 r.p.m. in a 30-foot and 24 h.p. at 600 r.p.m. in a 36-foot boat. In our fast runabout, which is perhaps used for a tender or for fast inside work, we must have more power, and this we will place at 36 h.p. at 900 r.p.m., or 40 h.p. at 1,000 r.p.m.

Here, then, is our problem, to so design a motor of such size as will give 16 to 24 h.p. at 400 to 600 r.p.m. and weigh, with complete ignition



A type of three, en bloc casting, two of which make a six-cylinder engine.

PART

By W. S.



An example of twin casting with extremely large ports and valves.

including two or three domestic motors, at approximately one h.p. for each five cubic inches. These are, however, results that are obtained at higher speeds than those we have determined upon for our general conditions. It is understood that this ideal type is a general purpose engine, and if a ratio of 1 to 5 is good practice for a racing motor, we will, for good results double our ratio, making it 1 to 10, which at 1,000 r.p.m. will call for 400 cubic inches to give us the 40 h.p. we ask for at that speed. Conditions being regular, we will favor a long stroke as one that goes nicely with the revolutions we have determined upon. Dividing the number of cubic inches, 400, by 4, the number of cylinders we have in mind, we have 100 cubic inches for each cylinder.

Again, dividing the individual cylinder displacement, 100, by the stroke, 6, we find it corresponds to a diameter of 4.6 inches. Now 4.6 inches is an odd size, and as we have liberal power excess in our ratio, we will make the diameter 4.5. Also, now that the racing rules have been changed, there is no reason for taking every advantage of all possible inches in the 400-inch class by making an odd size. Thus we have determined the following characteristics for our engine. It is to be four-cycle, four-cylinder, $4\frac{1}{2}$ " diameter, by 6" stroke. This engine must give 4 h.p. per 100 revolutions at from 400 to 1,000 r.p.m. to accomplish the work in the types of hulls we have laid out for it.

Now what form of cylinder shall we adopt, where shall we place our valves, and what size shall they be? In considering the type of cylinder, we must consider all conditions before adopting any particular construction. The three principal types are usually alluded to as T-head, L-head and valve-in-head, or I-head cylinders, with several varieties of each. If we were out for power alone, and did not intend to make a point of height, quietness, accessibility or general appearance, we would use the valve-in-head type, as this is, probably,

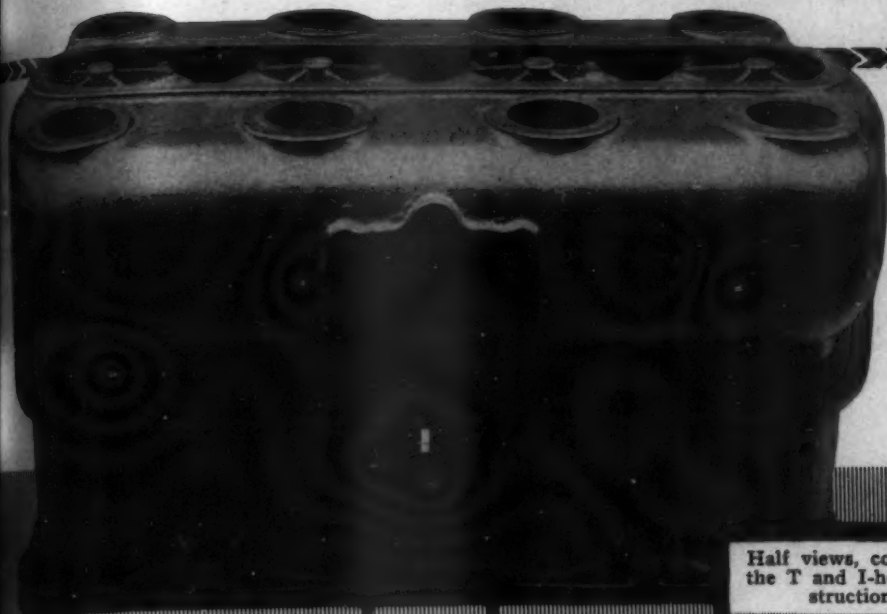
and reverse gear and cast iron base, about 800 lbs. for the cruiser class. As this engine has long, long runs, often in bad weather, when it is perhaps your life or the engine's, the bearing surface and oiling and factor of safety per horsepower should be about 3 to 1. Our first step is to take a list of engines such as is printed in the December issue of *MoToR BOATING*, and selecting any ten of the leading makers as judged by their performance in public, we reduce the piston displacement (stroke x area) to cubic inches per h.p. While we are at it, we select an equal number of foreign engines and treat them in the same manner.

We are at once attracted by a very evident fact. The ten foreign engines are all within reasonable limits of one another, with their average very high. Only two or three of the domestic engines class up with the foreign in this respect of cubic inch per horsepower, the average for the ten being much lower than it should be. Plotting a ratio curve for the above, we find that one or two foreign engines deliver one h.p. for each three cubic inches of piston displacement with a greater number,



A typical twin casting, used to make two, four and six-cylinder engines.

and their DESIGN



An excellent example of a four-cylinder, T-head block, with large water jacket space.

ONE

Howard

the most powerful form of cylinder. It represents the greatest cylinder volume with the least cooling surface. Fired in the center, the combustion is very rapid. The valves being in the head are very efficient when properly located. There is an equal flow all around a valve in the head, while the side facing the cylinder of a valve in a pocket is the only part equaling the former in efficiency. In many cases the edge of the valve is so close to the wall of the valve chamber that there is very little space for the gas to pass, even when wide open. Valves quarter the area or half the diameter of the cylinders, if placed side by side in the head and in separate cages, will extend beyond the cylinders. If the engine is run very hard the exhaust valve in a cage will not always keep cool. Some makers get around this by seating the exhaust valve directly on the head, which is properly cooled, using a cage for the inlet valve.

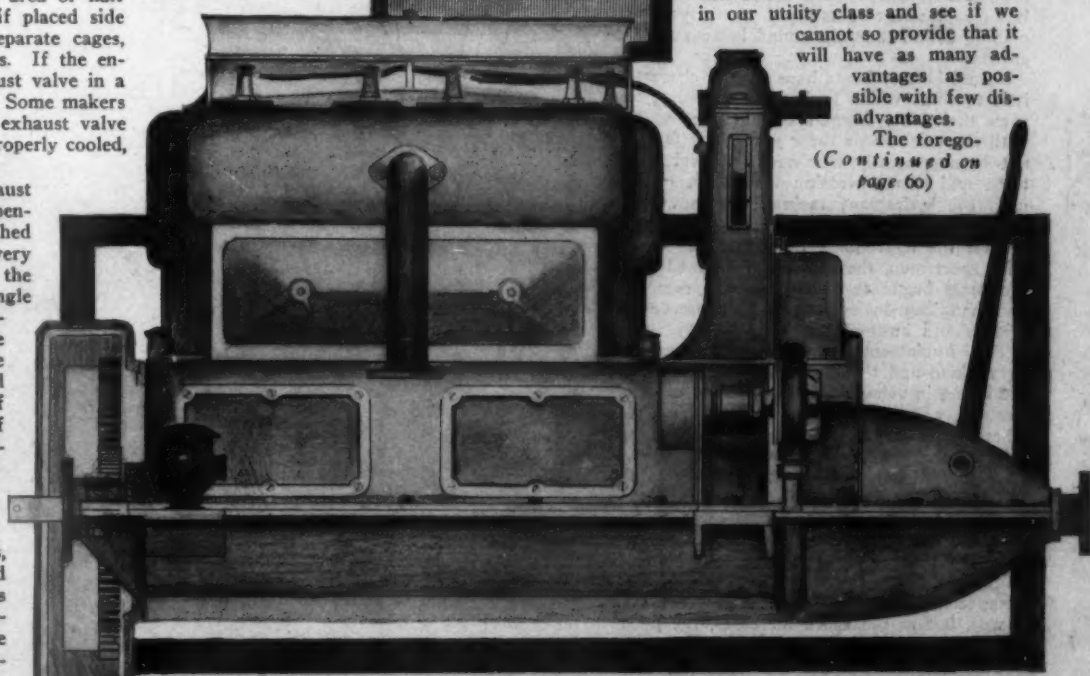
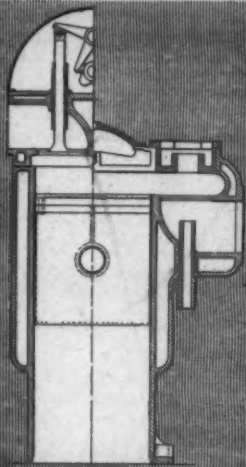
To remove or replace an exhaust valve, it is passed through the opening for the inlet and is then fished up to its own seat. When very liberal sized valves are used in the head they are placed at an angle seated directly on the water-cooled head, which is removable for accessibility. One of the line illustrations gives two usual forms of construction—half of a T-head drawn beside a half view of conventional form over-head valve.

Some extra height but less width is required for the over-head valve gear, which we find has, in some cases, slightly greater power and economy for equal size engines over either the T-head or L-head. On the other hand, the valve gear is usually more complicated and noisy and hardly as accessible as that of the two other types. Valves in cages

require grinding more frequently than when seated directly over a water-cooled surface, due to their higher temperature, causing the carbon to burn on and pit.

The exposed position obviously necessary in this over-head type fouls the spark plugs under conditions that would not cause fouling or short circuits in a T-head. As the advantages of the over-head type are a slight gain in

Half views, comparing the T and I-head constructions.



The "Ideal Utility," four-cylinder, four-cycle, en bloc motor, designed by Mr. Howard for MoToR Boating. In the author's opinion the ideal general-purpose engine for cruisers and fast runabouts is one having $4\frac{1}{2} \times 6$ -inch bore and stroke and a speed range of from 600 to 1,000 r.p.m.

power and economy at the cost of other benefits mentioned above, for our particular purpose, we discard this type at this time.

We now have the T and L-heads to consider. In an L-head, with valves all on one side, there is not much less exposed firing surface than in a T-head. An L-head having its inlet valve directly over the exhaust or in the head of the cylinder has a slight advantage in this respect over the T-head, and with this construction can use valves as large as in the latter and larger than can be used to advantage in the parallel location in the L-head. The L-head has the manufacturing advantage of one less gear and cam-shaft with bearings and for the user a slightly less number of parts to maintain. In the T-head motor the disadvantages seem to be principally somewhat more firing surface for cylinder volume and increased shop cost to manufacture, due to additional machinery and to fitting parts on both sides of the motor.

On the other hand, the T-head, when properly designed, can crowd the over-head valve engine for first place in power output. This is also true of the L-head with over-head mechanically operated inlet valves. With the plug located on the inlet side of a T-head, it is in clean, fresh gas, does not foul easily, enabling the carburetor to have quite a range of mixtures that still ignite. Large valves, independent timing for each side, uniform expansion and construction of cylinder, accessible and uncrowded distribution of parts and a general uniformity of outline on each side are characteristic of the T-head. There seem to be three classes of engines—one made for power, one for manufacturing output, and a utility class. As we cannot have all the advantages in a single class, we will select a T-head motor, put it in our utility class and see if we cannot so provide that it will have as many advantages as possible with few disadvantages.

The foregoing
(Continued on
page 60)

In the last two issues of MoToR BoATinG we have discussed two standard forms of cruiser underbodies, the V-bottom and the round bottom, taking up the various advantages of each. In this number we take up an entirely new and different principle for a cruiser and present an article by one of the foremost authorities in the world.

Why I Believe in a

The Application of the Planing and Resistance Re-
A Method of Attaching the Planes Which Will

By William



Disturber IV,
one of the most
successful hydroplanes
using the Fauber principle.

IN this article, the word cruiser is understood to apply to the class of motor boats in which speed is one of the important considerations, and yet a type of boat which is seaworthy, dry and comfortable.

The hydroplane, as with all other kinds of boats, and all inventions, has its limitations and particular advantages for certain purposes, and my effort herein shall be to, give such information and theories, as I can, toward the development of the hydroplane cruiser.

My comparisons will take into consideration the round bottom, or displacement hull, and the V-bottom, or part displacement and part planing hull. In fact, however, round bottom hulls have some planing action if driven to high speeds, and V-bottom boats are more or less displacement boats at all speeds, yet more planing action than the round bottom at high speeds.

Round bottom boats have certain characteristic features which limit their efficiency, and even their use, beyond certain speeds, but, until the last two or three years, this fact has not been generally admitted by naval architects, and this profession would not give in until the hydroplane racing boat showed its stern to the displacement craft.

First the hydroplane racer became popular with sportsmen, then the old-fashioned naval architects began to frame rules to segregate and handicap hydroplanes and preserve old friends and business.

The fundamental difference between the hydroplane and the displacement boat is that the latter, in principle, is designed to take advantage of the *least resistance of water*, whereas the former is designed to take advantage of the *greatest resistance of the water*. In a way, the hydroplane corresponds to the turbine engine and the displacement boat to the piston engine.

In round bottom boats, the shape of the hull is worked out to give the easiest stream lines and slip through the water with the least resistance. Water displaces easily at slow speeds, but as the speed increases, the power required multiplies.

Round bottom hulls, and boats having a continuous moulded surface, have another inherent disadvantage at high speeds, due to the

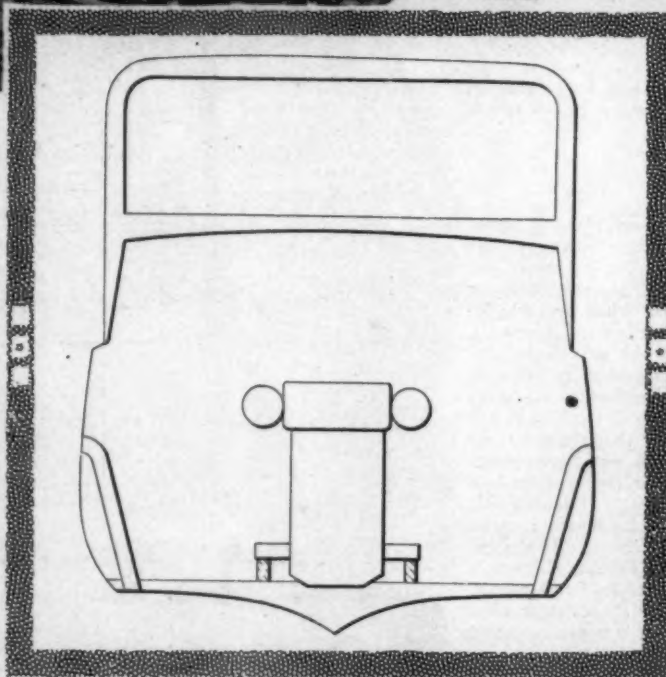
resistance would otherwise terminate. In effect, this increases wave resistance and friction area. In some forms of hull the same clinging tendency of water causes a loss of speed, due to unnatural stream-line resistance on the after part of the body.

In displacement boats, one of the principal factors of resistance is wetted surface. While the boat rises and planes to a limited degree, the wetted surface is larger because of wave action and the water clinging to the bow and sides.

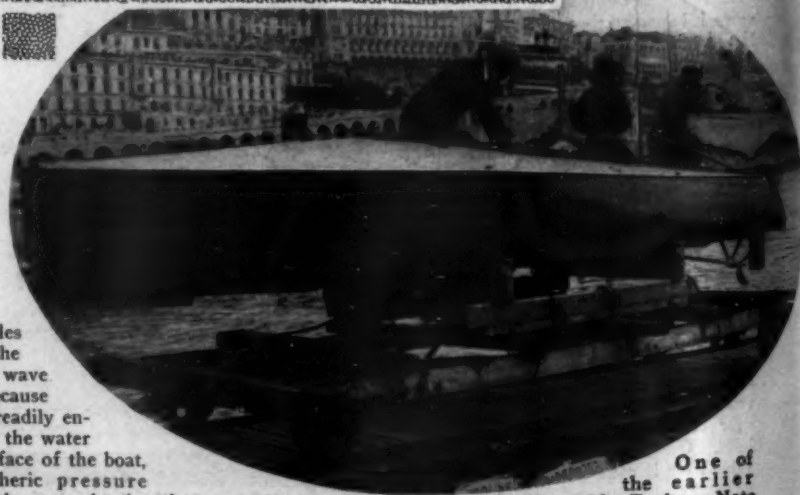
Displacement boats are designed after the lines of a fish, but in high-speed motor boats the naval architect is forced to cut off part of the tail of his fish, and this is largely the reason why an ocean liner can make the same speed as a motor boat with a small percentage of the horse power per ton of weight. All high-speed motor boats and hydroplanes leave a trough in the water behind, just as a fish would if its tail were cut square off. My object in bringing out this point will be made clear later in the application of the principles to the hydroplane.

In comparing the V-bottom with the hydroplane, I believe that there are no advantages except possibly at some speed below 20 miles the V-bottom craft might show less resistance, but I think that this difference, if it exists at all, will disappear as the hydroplane cruiser is developed. There really has been

Detail of midship section of the hydroplane cruiser having air tubes.



disposition of water to cling to an unbroken surface. At high speeds the water rises above its natural level along the bow and sides and above the natural wave heights because air cannot readily enter between the water and the surface of the boat, the atmospheric pressure preventing the water leaving the boat at the line where wave



One of the earlier multi-step hydroplanes designed by Mr. Fauber. Note the air tubes which lead from the sides of the boat.

Hydroplane Cruiser.

Reducing Principles to Cruisers of the Faster Type.
Not Reduce the Structural Strength of the Hull.

H. Fauber.

very little done in the direction of perfecting the hydroplane cruiser.

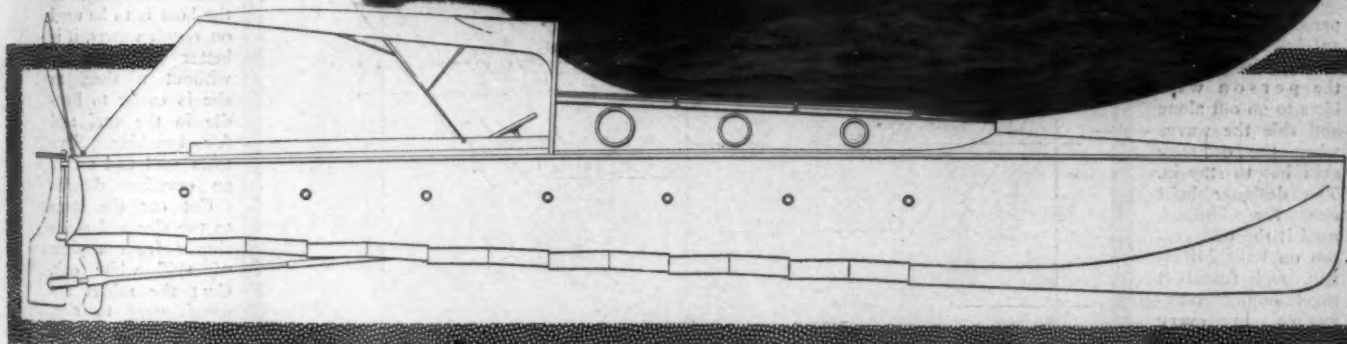
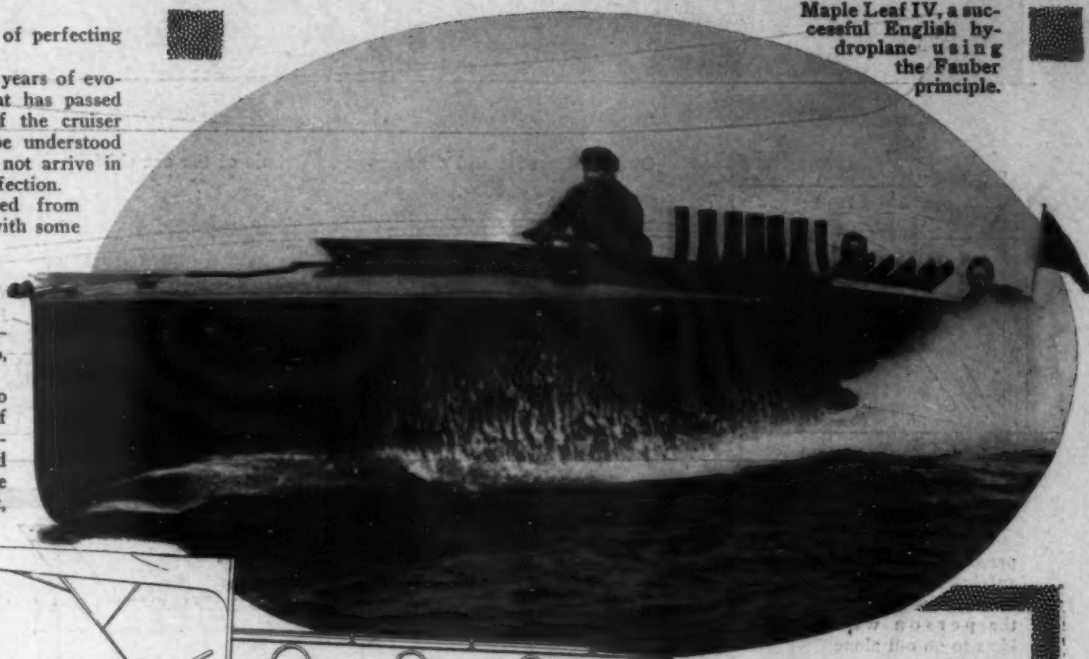
When one considers the many years of evolution that the displacement boat has passed through, and that thousands of the cruiser type have been built, it is to be understood that the hydroplane cruiser will not arrive in one leap from conception to perfection.

Starting with the data gained from racing hydroplanes, a designer, with some degree of originality and good engineering ability, should be able to produce a hydroplane cruiser that would show greater speed and, in other respects, be superior to, or equal to, the V and round bottom.

The first consideration is to have plenty of h.p. per ton of weight. The refinements in proportion of weight to h.p. should come afterward. Assuming the hull to be between 35 and 50 feet,

We expect to continue this series of articles along the same lines, taking up the different shapes of underbodies for the fastest hydroplanes and later the displacement runabouts. All of these articles will be written by authorities, and the one on the V-bottom runabout will be written by Mr. William H. Hand, Jr., himself.

Maple Leaf IV, a successful English hydroplane using the Fauber principle.



Hydroplane cruiser designed by Mr. Fauber for a speed of from 33 to 40 miles an hour with a 200 h.p. motor weighing 1400 pounds.

the general lines and the number of planes are to be decided.

I think that the first important thing to realize is that the getting out of a successful

cruiser requires a little more respect for good design than has been shown in some of the freak speed boats.

First, pleasing hull lines above water are absolutely necessary to satisfy yachtsmen.

Second, the requirements of seaworthiness and strength cannot be accomplished in a box-sided, harsh bilge form of hull.

MULTI-STEP HYDROPLANES.

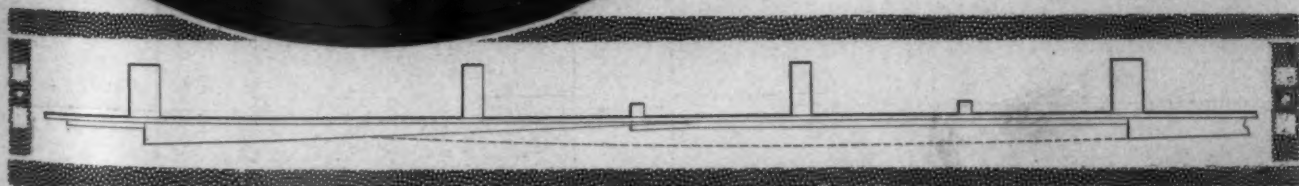
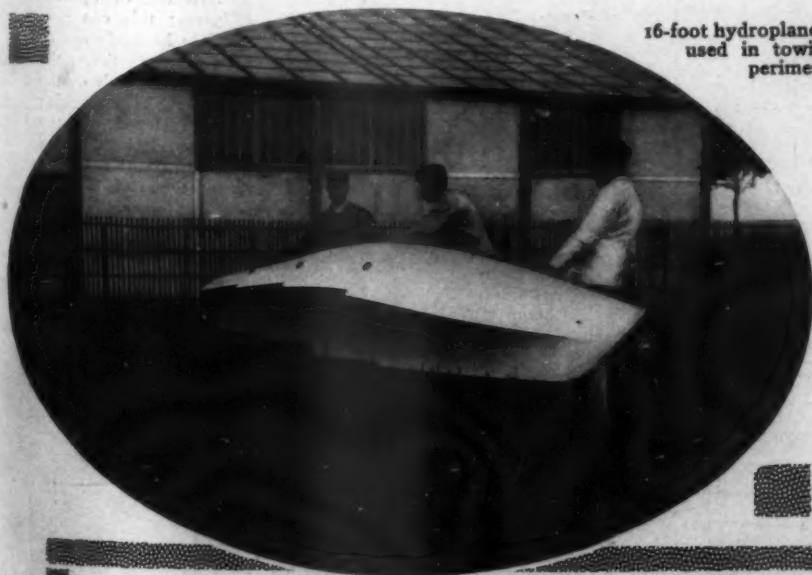
In cruisers a plurality of steps and planes is imperative to success. The single step has the same fault as too short a wheel base in bicycles and automobiles, viz.: produces too much pitching, which is disagreeable and also causes the boat to run harder. The weight of the long bow portion overhangs the single step more than is desirable.

For the cruiser type there are various strong arguments in favor of multi-step which are too lengthy to cover in the space at my disposal.

One of the features of the hydroplane, which make it superior to the round bottom boat, is the corner bilge or abrupt termination of the planing surfaces along the sides and the bow-plane. It is understood, of course, that the

(Continued on page 52)

16-foot hydroplane model used in towing experiments.



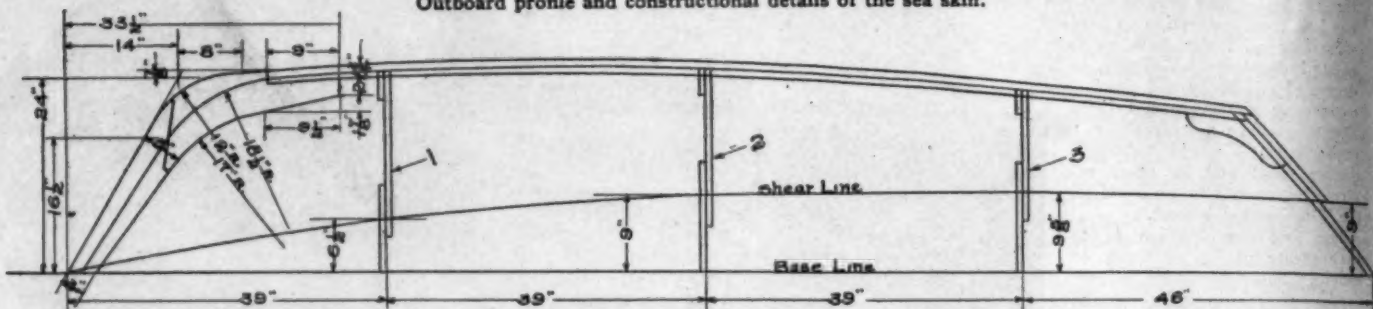
Detail of the plane and step construction for the hydroplane cruiser. Advantages are that the inside planking is continuous, and the planes have the greatest strength where strength is required. Scale $\frac{1}{2}$ " = 1'. Dotted line indicates flow of water under the planes.

Building a 13-Foot Sea Skiff.

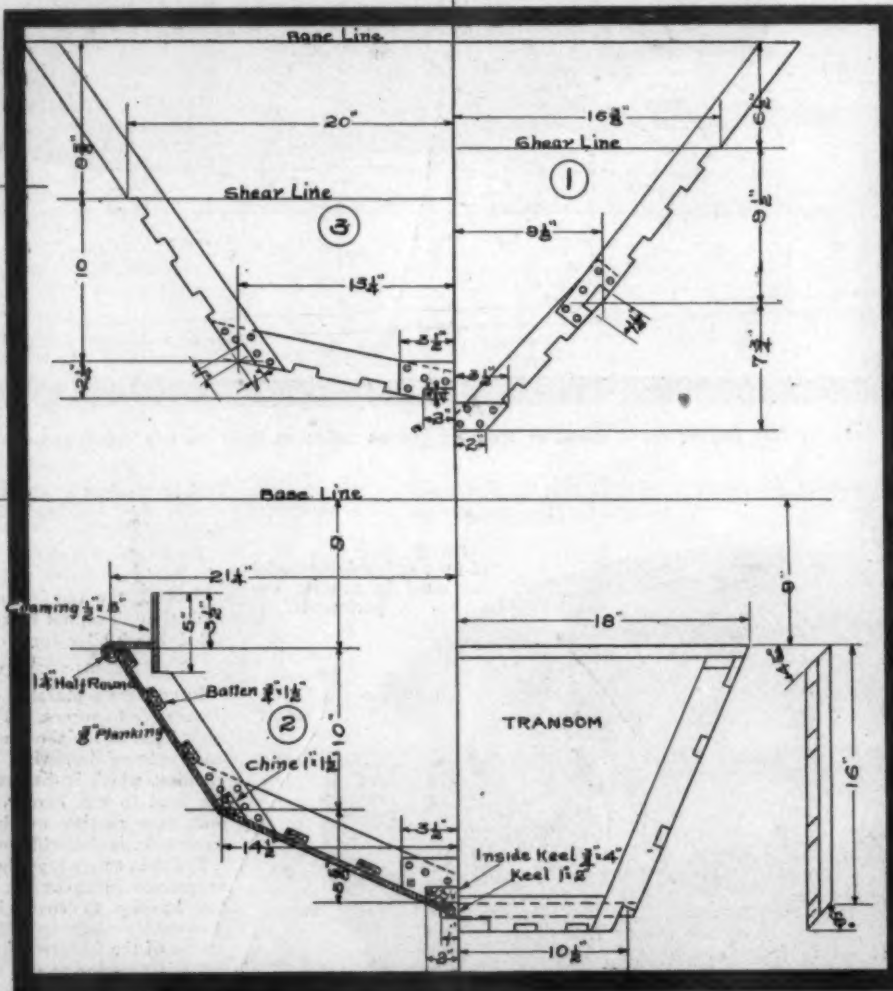
By Joseph Appleton.



Outboard profile and constructional details of the sea skiff.



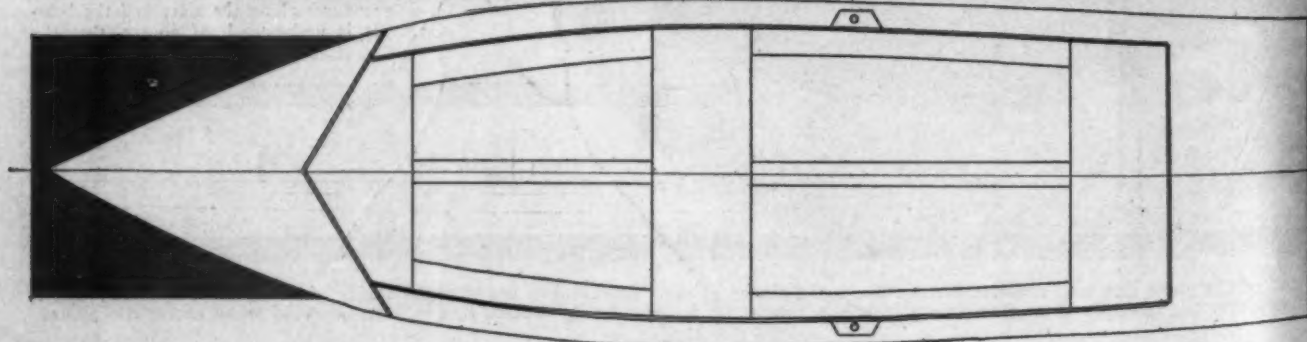
WHILE this skiff will carry three persons easily and safely, it was primarily designed for the person who likes to go out alone and ride the waves when the ordinary skiff has to stay in. The designer built one for himself, used it the past season on Lake Michigan, and found it exceptionally satisfactory in every way. For her size she is extremely seaworthy, and a wonderful surf boat—she has repeatedly come in through the surf when boats twice her size would not tackle it. As soon as one nears the breakers, he turns around and backs in, the skiff showing no inclination to turn broadside and being very easy to handle. The waterline being little more than a canoe's she is, of course, rather lively, but it is almost impossible to capsize her, and she can be heeled over till the water pours over the coaming, with still no tendency to turn turtle. She is also



very dry, the flaring sides keeping out the waves and spray. If the boat is to be used on rough waters, it is better to make her without a skeg, as she is easier to handle in the surf and for beaching. She tows well and makes an excellent dinghy.

Cut out the stern to the size and shape shown from a piece of 1 1/4" white oak. Cut the rabbet approximately to size, and fair up to the exact fit after the frame is assembled by bending a light batten around the frames. Make the transom like the pattern out of 3/4" cypress; this can possibly be made out of one piece. Screw the batten securely on the back. The planking is fastened to the battens because the screws will not hold in the end grain. Next make the three frames or moulds. These are permanent and stay in the finished boat, so make them out of 3/4"x2" oak or elm. Make them long enough to set up from the base line, and cut off at shear line after the

(Continued on p. 60)



The 45 Foot Cruiser

NAVAJO II



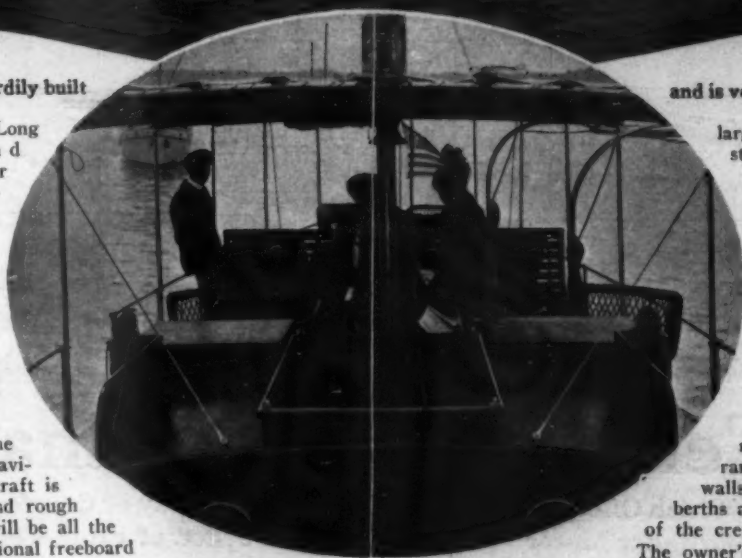
Navajo II is sturdily built

and is very seaworthy.

NAVAJO II is a Long Island Sound cruiser, built for Mr. A. P. Clapp, of Port Washington, L. I., by the Matthews Boat Co., of Port Clinton, O. She is practically a sister ship of Tobermory, built last year for Commodore F. W. Wakefield, of Vermilion, O., and has a length of 45 feet over all, with 44-foot waterline length, by a beam of 11 feet 3 inches and a draft of 3 feet.

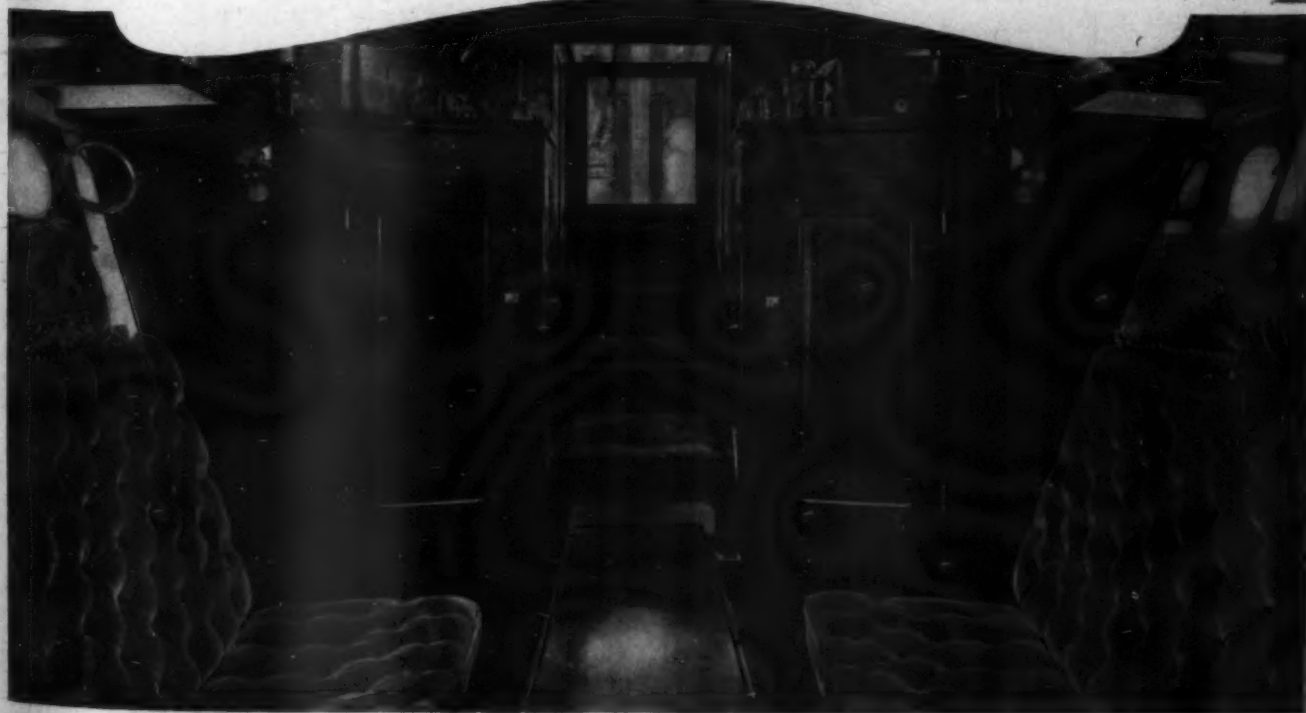
The construction follows the usual Matthews standard of heaviness and sturdiness, and the craft is exceptionally fitted to withstand rough weather. Her seaworthiness will be all the more apparent when her exceptional freeboard is considered.

Navajo II is laid out below with the usual chain locker forward, followed by a full width galley which is equipped with a



This bridge deck view was taken from a position almost directly above that assumed for the cabin picture.

large size deck-fill ice chest, stove, sink, working tables and plenty of locker space. The swinging doors aft lead into the main cabin, which, as can be seen from the photograph, is fitted with wide transoms and folding table. Accommodations for sleeping four are provided in this compartment. Stairs aft lead up to the bridge deck, under which is placed the engine. The power plant consists of a 4-cylinder 6 x 8-inch Standard motor, and the fuel tanks are ranged on either side it along the walls of the engine-room. Pipe berths and a toilet for the convenience of the crew are provided in this section. The owner's double stateroom follows the engine-room bulkhead, and there is another stateroom at the extreme after end of the boat, separated from the forward one by toilet and vestibule.



Photographs by M. Rosenfeld.

Looking aft in Navajo II's forward cabin, showing the folding table, the ample locker space, and the companionway stairs leading to the bridge deck.

A 50-Foot V-Bottom Cruiser.

A 20-Mile Express Cruiser Having Underbody Lines Very Similar to Those of Flyaway III. Full Automobile Control on Bridge and Duplicate Control at Fore End of After Cockpit.

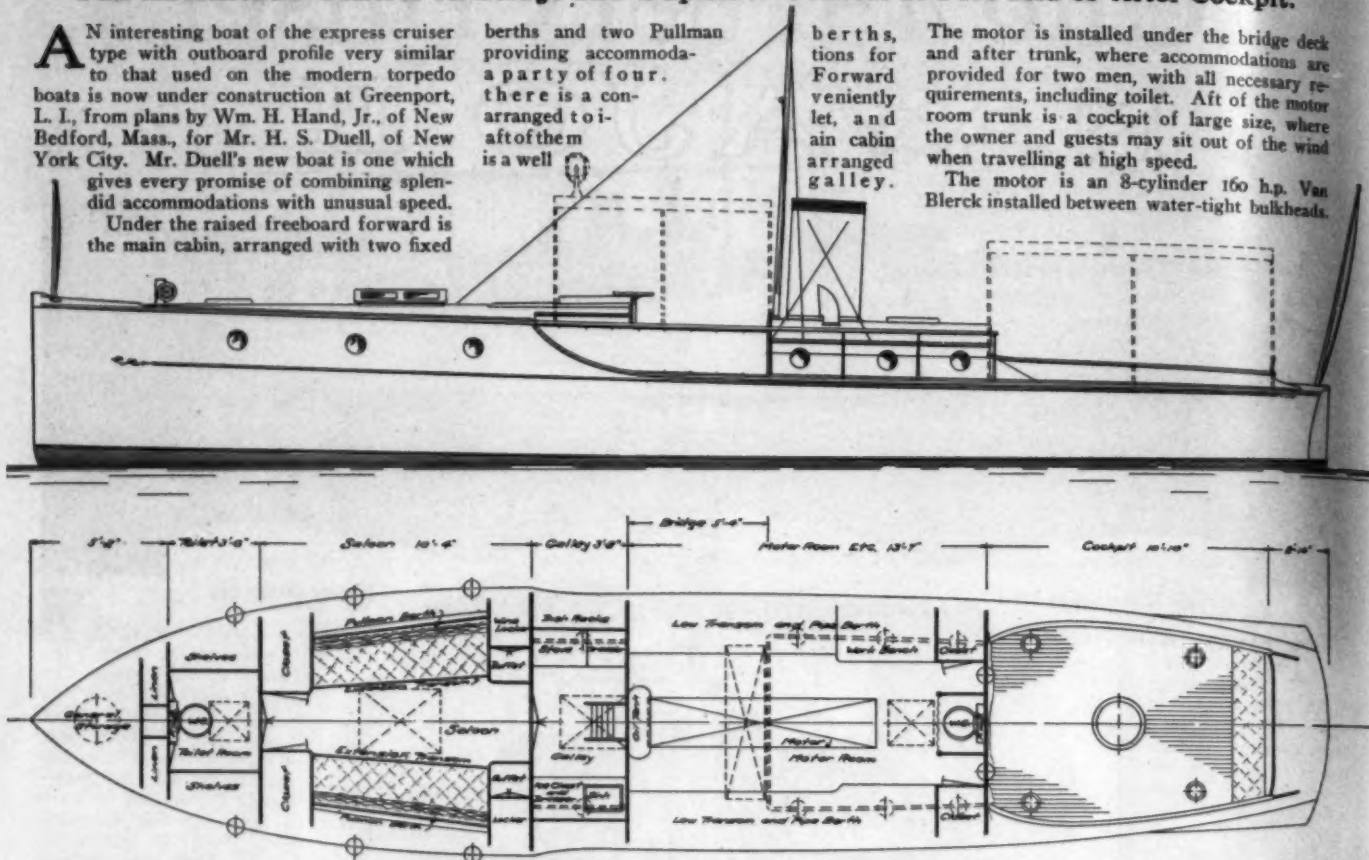
AN interesting boat of the express cruiser type with outboard profile very similar to that used on the modern torpedo boats is now under construction at Greenport, L. I., from plans by Wm. H. Hand, Jr., of New Bedford, Mass., for Mr. H. S. Duell, of New York City. Mr. Duell's new boat is one which gives every promise of combining splendid accommodations with unusual speed. Under the raised freeboard forward is the main cabin, arranged with two fixed

berths and two Pullman providing accommodation for a party of four. There is a conveniently arranged toilet aft of them is a well

berths, for Forward conveniently let, and a cabin arranged galley.

The motor is installed under the bridge deck and after trunk, where accommodations are provided for two men, with all necessary requirements, including toilet. Aft of the motor room trunk is a cockpit of large size, where the owner and guests may sit out of the wind when travelling at high speed.

The motor is an 8-cylinder 160 h.p. Van Blerck installed between water-tight bulkheads.



This new hand V-bottom cruiser has a length of 50 feet, an extreme beam of 10 feet 3 inches, and a draft of 2 feet 10½ inches.

Rice Ten-Passenger Runabout.

A Standardized Model Which Offers the Boatman Much in the Way of Comfort and Convenience. Having a 10 H. P. Two-Cylinder Motor Which Gives Her a Speed of From Ten to Twelve M. P. H.

THE Rice ten-passenger runabout, two views of which are shown in the accom-

panying photographs, has been designed by the Rice Brothers Company, of East Boothbay, Me., to serve the needs of the boatman who wants comfort with his boat. The hull has easy lines forward, working into quite a deep dead-rise amidships, where the engine comes, then widening out into a flat underbody. Excellent balance and seaworthiness are obtained by placing the engine in the center. The general dimensions of the boat are as follows: Length over all, 19 feet; beam, 5 feet; height at the bow, 2 feet 4½ inches, and at the stern 16 inches; draft, 18 inches.

The stem, keel, stern, top strake and frames are of oak, the planking is of white cedar fastened to the frames with brass wood screws of large wire, and the clamps and bilge stringers are of spruce. The deck is of cedar, laid with lapped joints, and covered with heavy cloth, canoe finish; the seats, seat backs, battens, coamings, ceiling, engine cabin and paneled bulkheads are of mahogany, and the floor is of white pine. The hull is painted on the inside with lead paint before any of the interior



An idea of the pleasing convenient cockpit attained from



appearance and the arrangement may be obtained from these two pictures.

finish is put in, and the outside is painted white above and light green below the waterline. The deck fittings are of polished brass, the rudder and tiller are of bronze, and the gasoline tank of 14 gallons' capacity is of copper. There is a copper pan under the engine flywheel.

The boat is equipped with an 8-10 h.p. Rice two-cylinder jump spark motor with reverse gear, the engine turning the propeller at 900 r.p.m., at which speed a boat speed is obtained of from ten to twelve miles an hour, according to

number of passengers carried. The bronze propeller wheel measures 14½ inches diameter by 20 inches pitch, and is of the three-bladed type, fitted to the tapered end of a ¾-inch Tobin bronze shaft.

The engine muffler, batteries and spark coil are completely housed in the mahogany cabinet, and the boat is of such width as to allow a passageway to one side of the engine, so that the passengers may pass forward or aft without climbing over seats or bulkheads. The automobile steering wheel with which the boat is equipped is attached to the after end of the engine cabinet, with wire center tiller rope and drums inside.

A Delaware River 36-Footer



Laureda, a speedy cruiser which

may be heard from this season.

THE accompanying photographs show Laureda, recently built by Messrs. Smith & Steel, of Delanco, N. J., for Mr. A. A. Jordan, a member of the Keystone Yacht Club of Philadelphia, after designs by J. Murray Watts, of that city.

The boat is 36 feet long by 10-foot beam, and she has a draft of 3 feet 2 inches. She is propelled by a Frisbie engine of the latest model, turning over at about 500 r.p.m. It was originally intended to have a 2-cylinder engine, but the owner wanted more speed and decided to use a 3-cylinder, 25 h.p. motor.

The arrangement plans call for comfortable accommodations for four people, with a separate toilet-room forward of the saloon, and a roomy combined galley and engine-room. There is a water tank shaped to fit the forepeak, and the space beneath is used for the chain well. The toilet follows



immediately aft, and then comes the long cabin. This compartment is 12 feet long, and is furnished with two transoms on each side, partitions being used to separate the forward berths from those aft.

A door shuts off the saloon from the engine-room, which latter also serves as the galley. The two-burner stove is located on the port side aft, and the sink is to the right of the stove. There is a work bench forward of the sink, and a wardrobe, which is duplicated on the starboard side, forward of this. Locker space for pots and pans is provided under the galley fixtures, while there is ample locker room on the starboard side for miscellaneous equipment. Stairs on the starboard side lead up to the cockpit, which has been subordinated in size to the requirements of the interior compartments. Stowage for provisions is provided under the cockpit deck.

Photographs by Joseph N. Pearce.



The three-cylinder Frisbie motor is seen in the view of the combined engine-room and galley, and the large sleeping accommodation for a boat of this size is brought out in the lower view.

A 37-Foot Trunk Cabin Cruiser.

Having Galley Forward, Cockpit Amidships, with Engine Compartment Under, and Saloon Aft. Designed and To Be Built According to a New System Known as the Nichols Arc Construction.

THE accompanying plans show a 37-foot boat of the cruising type designed by Mr. Frank Nichols for Mr. Geo. W. Eisenbraun, both of New York, which is to be built according to a process patented by Mr. Nichols and known as the Nichols arc construction.

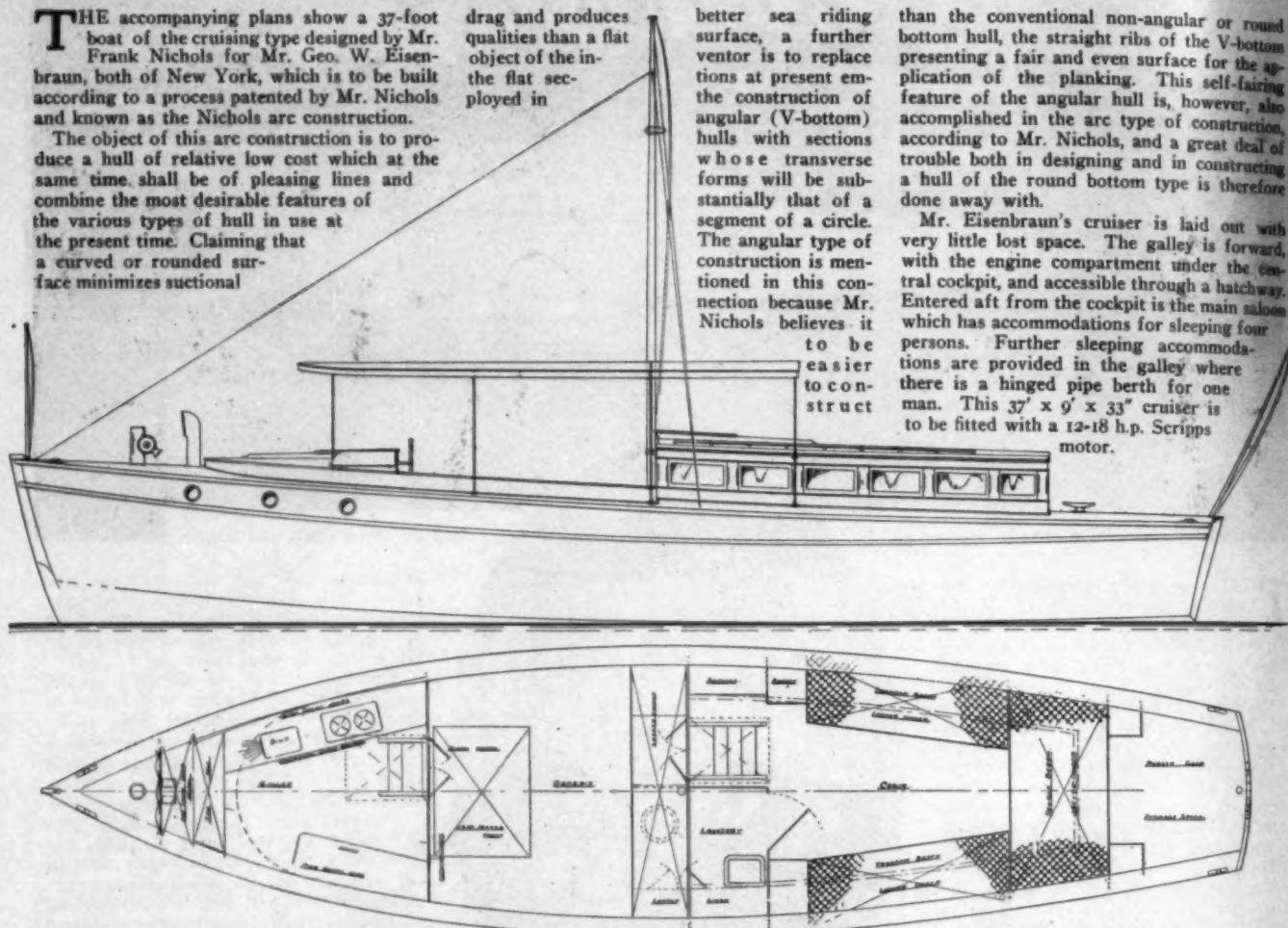
The object of this arc construction is to produce a hull of relative low cost which at the same time shall be of pleasing lines and combine the most desirable features of the various types of hull in use at the present time. Claiming that a curved or rounded surface minimizes suctional

drag and produces qualities than a flat object of the in-the flat sec-
ployed in

better sea riding surface, a further ventor is to replace the construction of angular (V-bottom) hulls with sections whose transverse forms will be substantially that of a segment of a circle. The angular type of construction is mentioned in this connection because Mr. Nichols believes it to be easier to construct

than the conventional non-angular or round bottom hull, the straight ribs of the V-bottom presenting a fair and even surface for the application of the planking. This self-fairing feature of the angular hull is, however, also accomplished in the arc type of construction, according to Mr. Nichols, and a great deal of trouble both in designing and in constructing a hull of the round bottom type is therefore done away with.

Mr. Eisenbraun's cruiser is laid out with very little lost space. The galley is forward, with the engine compartment under the central cockpit, and accessible through a hatchway. Entered aft from the cockpit is the main saloon which has accommodations for sleeping four persons. Further sleeping accommodations are provided in the galley where there is a hinged pipe berth for one man. This 37' x 9' x 33" cruiser is to be fitted with a 12-18 h.p. Scripps motor.



A 12-18 h.p. Scripps motor, which will be installed in this 37-footer, is expected to give her a speed of 9 m.p.h.

Wayfarer, a 51-Foot Shoal-Draft Cruiser.

THE Matthews Boat Company, of Port Clinton, Ohio, have built for Robert Henkel, of Detroit, Mich., a shoal-draft tunnel stern 51' x 12' x 28" cruiser that has been most successful in operating qualities.

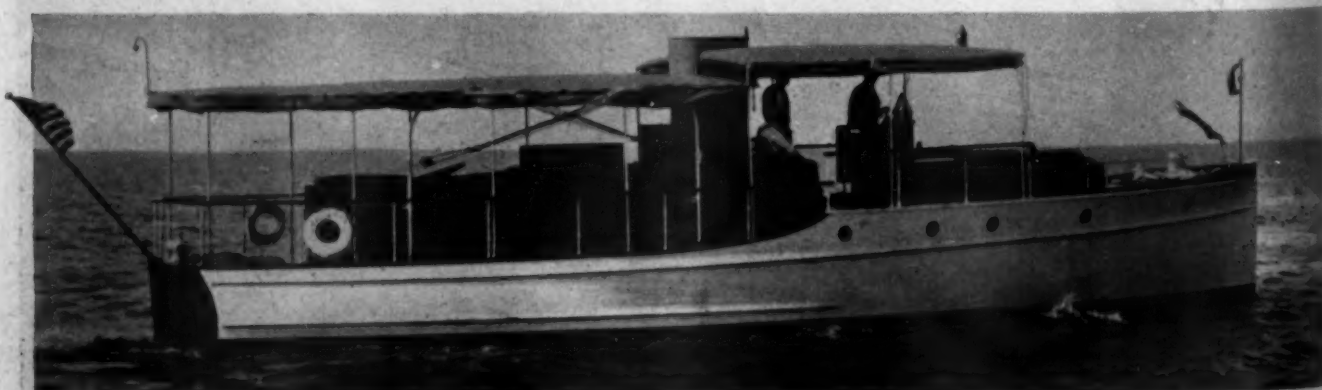
The features considered were ease of handling, one-man control, good ventilation, thorough screening, shoal draft, and a boat on which one could be as perfectly comfortable as at home. The equipment and finish were very expensive, as nothing was omitted that would make the boat complete.

The general arrangement provides for sleeping quarters forward, engine-room amidships and cabin and galley aft. A toilet room adjoins the two staterooms forward.

The motor room is metal lined, and arranged to receive the motive power, which consists of a 30 h.p. 4-cylinder Murray & Tregurtha motor, and an independent 1 K. W. Fay & Bowen electric plant. The gasoline is also installed on the sides, under the deck, in copper pans, the tanks having a total capacity of about 200 gallons. Owing to the beam of the boat the

engine-room is very roomy, and accommodations for one paid hand are here provided for, in the way of a pipe berth, toilet and lavatory. The motors are placed between watertight bulkheads, so that there is little chance for trouble in the case of a hole being stove in the boat, in either the forward or after compartment. Wayfarer is controlled entirely from the steering wheel location.

The boat is well lighted, and ventilation is secured by means of the stack, windows and ports.



Wayfarer is a Matthews craft powered with a Murray & Tregurtha motor and built for Mr. Robert Henkel, of Detroit. Her chief features are one-man handling, ease of control, good ventilation, thorough screening and home comfort.

Napu, a Clean-Cut Runabout.



Napu, which, being interpreted, is "Little Bounding Deer," is an 18-miler in use at Greenport.

NAPU, or "Little Bounding Deer," as translated, was designed and built by the Greenport Basin & Construction Co., of Greenport, N. Y., to fill the demand for a speedy runabout of refined appearance which would be a good seaworthy craft, have a large, roomy, self-bailing cockpit, and house the motor under conditions where it would be absolutely protected from the elements, and permit of being given attention while running in heavy weather.

The dimensions worked out as 28 feet 7 inches over all, 28 feet on the waterline, 6 feet 3 inches beam over plank, and draft under the propeller 2 feet. Napu's clean appearance is vouched for by the illustrations.

As Napu attains a speed of 18 miles per hour, running her four-cylinder, four-cycle Sterling motor at 900 revolutions per minute, she may well be called a fast runabout. The motor installed has cylinder dimensions of $4\frac{1}{4} \times 5\frac{1}{2}$ inches and is rated at 35 h. p.

The general roominess and comfort of Napu as a family runabout are shown by the 10-foot cockpit space with the added 2 feet of bridge deck making good hanging space, and the

cabin space forward with 4 feet 3 inches headroom, satisfying the requirements for a com-

fortable place to work at the engine and a lounging space for two persons.

The construction is made very rugged by the use of oak scantling, white cedar planking and ship-laid white pine bridge, cockpit and after decks. The raised deck is canvas covered, and mahogany trim is used throughout.

The equipment and outfit is very complete, comprising special cast bronze hull fittings, brass deck fittings, air ports, pressed steel gasoline tanks, Wicker Kraft chairs, helmsman's bench of mahogany and oak, and the equipment required by law. The awning used was especially designed by the builders to combine the appearance of the automobile top and the lifting bows for access at each end with the necessary light weight and strength for marine practice. The steering wheel is of the automobile type, and the reverse control is in the form of another wheel located handy to the helmsman's reach.

One season's use of Napu has demonstrated to her owners by cross Sound runs from Greenport to New London in all weathers and also in general use as a ferry and family launch that she is absolutely seaworthy and dependable under all conditions.



Photographs by Edwin Levick.



Napu's ten-foot cockpit and two-foot bridge deck provide ample room for a large party. The motor is housed under forward in a compartment which is noteworthy for the amount of elbow-room it offers.

The PRIZE CONTEST in Questions & Answers

The Object of a Handicap Rule.

A Discussion as to Whether a Premium Should Be Placed on Efficiency of Engine and Hull. Advocates of Giving Every One an Equal Chance to Win Irrespective of the Boat's Condition.

THE PRIZE CONTEST—Answers to the First Question in the March Issue.

Handicap Rules Should Promote Progress.

(Prize won: Compass.)

HANDICAPPING should theoretically give all boats in a race an equal chance of winning. The first rub is that a race is not a race if the boats are of entirely different classes, either of type or of speed. It is as absurd to race a sea-going cruiser against a hydroplane, or a heavy duty 6-mile-per-hour cruiser against a 20-mile express cruiser, as it would be to race a dray-horse against a blooded race horse. Therefore classification is necessary.

The next rub is that if a theoretically correct handicapping system were found and used, the worst tub afloat could compete with the finest craft that could be built. A past-performance handicap, if honestly made and applied (which we believe is one of the things that "can't be did"), is open to the latter objection, as it takes away every incentive to improve the design, construction and handling of boats. It would save lots of trouble and gasoline bills to leave the boats at their moorings and shake dice for the prizes, instead of running a race based on a past-performance handicap.

A proper handicapping rule should penalize freaks and encourage the development of boats of sane, seaworthy and comfortable designs. Freaks are at both ends of the line—boats that are underpowered and boats that are overpowered. It has been absolutely unfair to give a boat, say, a twenty-seven-foot cruiser with a 3. h.p. engine, which can hardly get out of its own way, such a tremendous time allowance that normal cruisers of similar size which make eight to ten miles per hour had absolutely no chance of winning from such a snail. It has also been as unfair to not handicap the twenty-mile boat to bring it down to a corrected time somewhere near that of her competitors.

The A. P. B. A. rules have come far short of fulfilling the desired results. But they have been the best we had. With their 1915 changes they should meet the requirements very closely if the race committees will take care of the matter of classification. The reason for this is that they are based upon both theory and practice.

Theoretically, a boat's speed will increase with its length and its power, and inversely with its displacement. Getting its length is a cinch. Getting its power is a comparatively simple matter, but one on which the A. P. B. A. rules have been away off. Now that the speed element is taken into account, this factor is approximately what it should be. To show how closely this system of computing horsepower comes to the system used for computing the horsepower of automobile en-

gines, the following results of the two systems may be compared:

Four-cylinder, four-cycle engine, 4½ bore, 5½ stroke at 1,000 revolutions:

A. P. B. A. rule, H.P. = 27.56

A. L. A. M. rule, H.P. = 30.65

And yet under the 1914 A. P. B. A. rule this engine was rated at only 18.3 H.P., regardless of its speed.

The only other factor is the displacement. To get this exactly the boats should be weighed. This is impracticable, as experience has shown, even with the light racing craft. The L. W. L. × an approximate midship section comes very close to the real thing. The old way of measuring the midship section at a point 55 per cent. of the boat's length back from the bow was not as fair as the new way of taking it at the point where it is greatest.

Another advantage of the A. P. B. A. rules is that it is the system most generally adopted.

Many even habitual "racers" seem to think that the race committee arbitrarily hands out some figures of their own invention, upon which the allowances are based. For the information of such men, attention is called to the fact that allowances are based upon the arbitrary constant 4.167, and the rating divided by this constant gives the speed in knots which a boat is supposed to make. Thus, a boat with a rating of 41.67 is supposed to make 10 knots, one whose rating is 33.34, is supposed to make 8 knots, and one whose rating is 51, is supposed to make 12 knots; and their handicaps are based on this presumption. If you want to see how fast your boat is supposed to go, divide its rating by 4.167. If it is a cruiser, don't be discouraged if the expected speed is too high, for there are very few cruisers which can make more than 85 per cent. of their theoretical speed.

It is true that any arbitrary rule like the 1915 A. P. B. A. rule puts a premium on the efficiency of the engine, of the boat's lines and of its propeller. But why shouldn't it? If a man tunes up his engine to get the most out of it, builds new boats to get the best possible lines, and tries out different propellers until he gets one that "fits," he should be given all the advantage he gains by such efforts. If he is not, the incentive to do such things is taken away, and the racing game does not advance. E. W. MARSHALL, N. Y. C.

Questions for the July Issue.

1. What are the causes of an overheated motor and how can they be prevented?

Suggested by D. S. Ward, Lockport, N. Y.

2. What auxiliary sail rig is best for small cruisers of the raised deck and trunk cabin types? Show how to determine the proper sail area, and how to locate the correct positions for masts, centers of area, etc.

Suggested by A. C. Davis, Ithaca, N. Y.

3. Suggest and illustrate a method for stowing and handling signal flags, on a small cruiser, so that they will be accessible when wanted.

Suggested by H. C. L., Gainesville, Ga.

RULES FOR THE CONTEST

Answers to these questions, addressed to the Editor of MoToR Boating, 119 West 40th St., New York, must be (a) in our hands on or before May 25th, (b) about 500 words long, (c) written on one side of the paper only, (d) accompanied by the senders' names and addresses. (The name will be withheld and initials or a pseudonym used if this is desired.) Questions for the next contest should reach us on or before the 25th of May.

The prizes are: For each of the best answers to the questions above, any article advertised in the current issue of MoToR Boating, of which the advertised price does not exceed \$25, or a credit of \$25 on any article advertised in the current issue of MoToR Boating which sells for more than that amount. (There are three prizes—one for each question—and a contestant need send in an answer to but one if he does not care to answer all three.)

For each of the questions selected for use in the next contest, any article advertised in this issue of MoToR Boating, of which the advertised price does not exceed \$5, or a credit of \$5 on any article advertised in this issue of MoToR Boating which sells for more than that amount.

If you win the prize you must allow us to do the ordering of the prize you select.

When you send in your answers you must state what you will take for a prize should you win one.

Fun or Science, Which?

IN my opinion there are two objects to the handicapping rules in general use at present. There is one handicapping rule in use among most of us motor boatmen who can't afford a lightweight high-speed racing motor and another in use among those who can.

The first promotes good fellowship, good sportsmanship and a keen friendly rivalry. This rule handicaps the boats according to their relative speeds alone, regardless of power or size, and leaves the winning to the best man; that is, to the man who can handle his craft to the best advantage and keep his motor turning at top speed to the last second.

The object of the second rule is to aid the development of the hull, engine and equipment. The boats are not handicapped according to their speed, but according to the length of the load waterline, the area of the midship section, the number of cylinders and the displacement of the piston.

Therefore in contests under the second rule, which are speed races only, the man who has been able to perfect his engine and hull to the highest degree, barring accidents, is the one who wins.

The fundamental points which a handicapping rule should take into consideration are rather hard to discuss, as a great deal depends upon what kind of a race is meant.

We "little fellows" get just as much real enjoyment out of our races as the "big fellows" do out of theirs. As none of our boats

make over twelve miles an hour, we can't use the same rule as would be applied to craft making forty-five to fifty miles an hour. The only rule that we require is that all boats shall be handicapped in direct proportion to their speed. Then it is strictly "up to" the owner to see that he is getting this speed.

Obviously, this rule would be unfair to the real racing boat. For these speed contests the boats should be handicapped by taking into account the length and displacement of the hull with all equipment in place, the number and size of the cylinders and the type of the boat, whether hydroplane or displacement model. Full directions for figuring these handicaps may be found in the A. P. B. A. handbook.

H. H. B., Schenectady, N. Y.

Give Every One an Equal Chance.

THE basic theory of the handicap is to equalize the chances of winning. Between the large and small and the high and low powered boats it assumes an equally efficient hull in each case, and it should not attempt to make it possible, as is sometimes supposed, for any old tub of a boat to win on allowance or to bring all of the boats in a race home at the same time. Obviously it cannot take into account all contingencies and, like any other rule, it can be beaten.

Fundamentally, the handicap rating should encourage the building of a type of craft that will be real boats and serviceable for other uses than racing. It should discourage the freak boat if possible, but encourage careful design and proper material and workmanship.

No one item of the present handicap rule of the A. P. B. A. has caused the discussion and comment that the h.p. rating of the en-

gine has.

The fact that this rule does not take into account the speed of the engine, but assumes all engines to run at a speed of 1,000 r.p.m. make it impossible to win with a slow speed engine where all other factors are equal. At the time this rule was formulated piston speeds in excess of that amount were rare but to-day double that is quite common. It would seem that this rule would be susceptible to modification and I would suggest substituting for the A. P. B. A. rule the following modification:

PLAN

\bar{d} = p a k

where

P = effective pressure

L = length of stroke

A = area of piston

N = number of cylinders

d = diameter of propeller

p = pitch of propeller

a = area of propeller blades

k = a constant to be determined for two or four-cycle engines and of a power to produce approximate horsepower

This formula would be applicable to any engine and would put the slow speed heavy duty engine of long life in the running with the lighter types. It would undoubtedly go far to increase engine and propeller efficiencies. The designer of engines and propellers would have the incentive to go after the one and only loophole to beat the rule; engines would be improved and, in the final analysis, more wholesome and lasting types of boats would be produced.

F. K. DAVIS, N. Y. C.

Making and Fitting a Gasket.

Several Methods Suggested for Making a Gas-Tight Joint Between Cylinder and Head.
Various Materials Recommended to be Used and their Advantages.

THE PRIZE CONTEST—Answers to the Second Question in the March Issue.

Manila Paper and Asbestos.

(Prize-Winning Answer.)

THERE are numerous materials suitable for making gas engine gaskets. Some that would be satisfactory under one condition would be entirely useless under another.

For instance, a good, strong manila paper (a good, clean piece of flour sacking will sometimes answer) makes an excellent gasket between cylinder and crankcase, or for hand hole gaskets, but in general would be practically useless under the cylinder head on account of the extreme heat.

To cut the manila paper, the only tool absolutely necessary is a small or medium size round-pein machinist hammer, although a sharp jack knife is frequently handy, and unfortunately a sharp one seems hard to find in the average amateur engineer's kit.

Now, to cut the gasket, place the paper in position on either crankcase or cylinder, according to which is most convenient, hold paper securely, locate bolt holes by gently rubbing the pein of hammer over paper, then a light tap or two will cut the holes.

Now cut the outlines of the gasket by tapping lightly with the hammer. If the iron is

paper still, after you have located the bolt holes, drop a cap screw, or more if necessary, into bolt holes. This will prevent shifting.

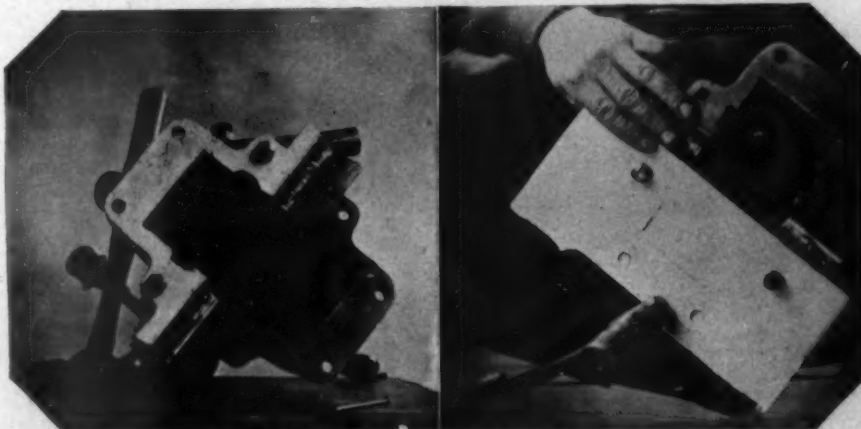
Before putting gasket into position oil it on both sides and sometimes it will be found advisable to give it a coat of graphite. On engines having the parting of crank case and cylinder through main bearing several thick-

nesses of paper may be necessary to give proper fit of crank shaft bearings.

There is a great difference in the machining of the cylinder and head, some makes leaving them quite smooth and others leaving a rough surface, consisting of numerous concentric rings which greatly assist in holding the gasket from blowing out.

Probably the most satisfactory material for cylinder head packing is regular gas engine packing, consisting of fine cop-

per wire woven in asbestos. This material is spongy enough to fit tightly into all the little inequalities when squeezed tightly and the



Method suggested by D. E. W. for cutting a gasket, and how it should fit after it has been cut.

rough on the edges your gasket will be improved by a little trimming. In case the gasket is large and you have trouble in holding the



copper wire gives it the necessary strength.

In cutting this kind of packing, especially on large surfaces, care must be taken not to stretch the material in cutting. If the hammer is depended on to do all the cutting the gasket is liable to be too large.

Use the pein of the hammer to cut bolt holes; then, instead of hitting hard enough to cut outlines, tap only hard enough to mark lines to be cut; then remove and cut with shears. There is a small tin snip with blade about $\frac{3}{4}$ " long made that the writer has found the best thing out for this purpose. A hollow punch the size of bolt holes is convenient to use if you don't wish to cut bolt holes with the hammer.

The tightness of cylinder head depends fully as much on the manner of tightening the bolt as on the making of the gasket. After placing the gasket and cylinder head in place, run nuts or cap screws, as the case may be, down by hand, not attempting to tighten them at all the first time around; then give one, say, one-quarter turn, following with the next pair, and so on until all have had a turn; then repeat, giving each another quarter turn, and continue until all are as tight as possible.

Often the last time or two around an eighth or less turn will be all that you can move them. By following this method the head is drawn down evenly and the same pressure is exerted at all points. As your engine warms up continue to take whatever slack develops, and you have a good tight gasket that should hold for a long time.

When regular gas engine packing isn't to be had ordinary asbestos paper often answers very nicely, although it is quite brittle.

D. E. W., Ithaca, N. Y.

Making a Good Job.

FIRST—Clean well both surfaces, taking care to see that the faces have no humps or ridges on them due to a stray hammer blow or bruise.

Second—Choice of material for gasket. Asbestos, fiber, or thin sheet copper is probably the most satisfactory faces are in good condition and the joint is even (as it should be) thin copper is probably the most satisfactory gasket material.

Third—Marking the gasket. Spread the material over the blank face (the face free of tapped holes or studs) and with the pein end of a machinist's ball-pein hammer "feel" for the inside edge of the face all the way around. With a little care the material can be not only marked, but, if the edge of the face is moderately sharp, it can be as good as cut through without marring the surface. If the material is copper a slight bending action will complete the separation of the disc traced by the hammer blows. The ball-pein can be used likewise to locate and cut out the holes for the screws or studs. One hole may be cut out first and then a cap-screw or bolt used to help hold the gasket in place while locating and tapping out the other holes. With an asbestos gasket an old gouge chisel used upon an end-grain block of wood will be found useful for making a clean edge to the holes. Ragged edges around the holes

in an asbestos or fibrous gasket may become annoying when slipping the gasket over the threads of the studs, or by filling up the threads of cap screws, or, possibly, by winding around a cap screw while it is being screwed down and thus damaging the gasket. The flat face of the hammer may be used for cutting the outside of the gasket.

Fourth—If asbestos is used smear at least one surface with graphite so that when the joint has again to be broken the gasket will not stay "frozen" part to one surface and part to another.

Fifth—Tighten in the screws or nut. Start

to make the gasket, we may proceed as follows:

Lay the material on top of the studs in the top of the cylinder and with a hammer tap lightly over each stud as indicated in Fig. 1.

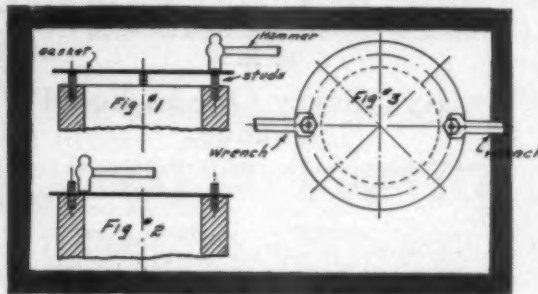
This will give the location of the holes to be cut in the way of the studs. These holes should be slightly larger in diameter than the diameter of the studs over the threads. With

these holes cut, slip the gasket over the studs and in a similar manner, by tapping lightly with a hammer as indicated in Fig. 2, an impression of the inside and outside shape of the gasket may be gotten. Cut the material to the lines thus made and the gasket will be finished.

Now take a machinist's scraper or a chisel and carefully scrape from the metal surfaces between which the gasket is to go, any portion of the old gasket or other foreign material which may be adhering thereto. Slip the finished gaskets over the studs, put on the cylinder cover and nuts and tighten up. In setting up the nuts be careful to set up the nuts on the opposite sides at the same time, as indicated in Fig. 3, as this will prevent springing the cover and when all the nuts are set up in this manner the pressure over the entire gasket will be uniform.

With a little care and patience a neat and workmanlike job is well within the capabilities of the average motor boatman.

W. R. F., Newport News, Va.



The three steps in the operation suggested by W. R. F.

all the screws or nuts, as the case may be, before tightening any one of them. Then go round and round the whole number, gradually tightening down.

R. MATTHEWS, Ithaca, N. Y.

Proper Material Important.

THE first thing required for making a gasket is the proper gasket material for the purpose intended. For internal combustion engines this material is usually copper-

Asbestos Interwoven with Wire.

IN tearing down my engine this fall, I found the gaskets in such bad shape that I had to replace them with new ones. First I scraped all the old pieces off and made the surface clean, then I smeared some black paint over the surface where the gasket was to go, and then pressed and smoothed down all over a piece of packing material upon the painted surface. Upon removing there was an exact impression of the shape required stamped on the packing. I then rubbed off the black paint from the casting.

In cutting the gaskets start with the inside holes and use a sharp knife or chisel, and then the outside can be cut around very easily with scissors. In punching out bolt holes, not having a regular punch, I secured some iron pipe nipples about 3 inches long and filed one end sharp so that it would cut along its inner surface. In this way a piece of

$\frac{1}{8}$ " pipe filed to the inside edge will punch $\frac{1}{4}$ " holes.

$\frac{1}{4}$ " pipe filed to the inside edge will punch $\frac{3}{8}$ " holes.

$\frac{3}{8}$ " holes filed to the inside edge will punch $\frac{1}{2}$ " holes.

Be sure to cut out for all the openings, as otherwise the water circulation will be interrupted.

In selecting the material for the gaskets in the compression base of two-cycle engines, be sure to get exactly the same material and thickness as was used before. This is important, for if thinner the shaft will bind in the bearings, but if thicker the shaft will be loose and the compression will leak out around it, causing loss of power.

L. R. K., Philadelphia, Pa.



Mr. Matthews' idea as to the proper manner of cutting a gasket for the cylinder head.

filled asbestos, or, in other words, asbestos with copper wire mesh insertion.

Having a piece of this material large enough

Getting Off Bottom

Good Suggestions for the Motor Boatman Who Attempts to Navigate Without a Chart. What to Do First When you Run Aground, and What Not to Do, Also.

THE PRIZE CONTEST—Answers to the Third Question in the March Issue.

Pulling the Boat Out of the Mud.

(Prize won: K. D. frames.)

WHEN the boat is run hard aground presence of mind is two-thirds of the formula needed to remove her in most cases.

Assuming that the unfortunate navigator and his passengers would prefer to remain on board, there are two other conditions to be considered.

First, if there is sand under the keel, the boat can, except in extreme cases, be released by rocking her from side to side. This forms a channel under the keel which makes it easy to shove off.

On the other hand, if the footing is in mud, the above course will only imbed the keel deeper. This the writer discovered too late to avoid the pleasure of basking between mud and sky for an entire afternoon.

Obviously, release from mud must be accomplished by slow, steady pull, and the following scheme will succeed where prying fails, and there is no risk of taking a mud bath.

As shown in the illustration, two oars from the tender, an oar and a boat-hook or pole or any other two levers available are shoved into the mud near the stern. A rope of suitable length is carried around the stem, each end

of which is tied to one of the oars. Now, if pressure be exerted on the oars as indicated by the arrows, the weight of those who are doing the work being in the stern, the tendency is both to lift the bow and to draw it backward and the great leverage will make it possible to release a boat under almost any conditions.

Where the boat cannot be released and the underbody is not flat enough to prevent capsizing an oar, pole, or other straight object may be placed under the stern as drawn, with a rope tied to the ends and wound once or twice about the flagpole socket. This device is crude but useful for any type of boat. Of course, certain types of boats are more adaptable to other devices. Where there is a heavy moulding at the sheer it is possible to prop the boat up with short sticks of wood. If the underbody is fairly flat, blocks may do.

In any case it is not only advisable but necessary, where a boat is used in tide waters, to carry some simple device for keeping a boat righted when out of water. Such a device is shown in the drawing. It may be stowed in a locker and will do its work to a "T" without injuring paint or wood. Where it is used an extra heavy pattern of flagpole socket will be needed. R. W. HUESTIS, Springfield, Mass.

Bumping the Bottom.

IF your wits are quick and your reverse gear positive, and you run aground on a fairly abrupt shoal, you can almost invariably back off on your own stern wave. The mo-

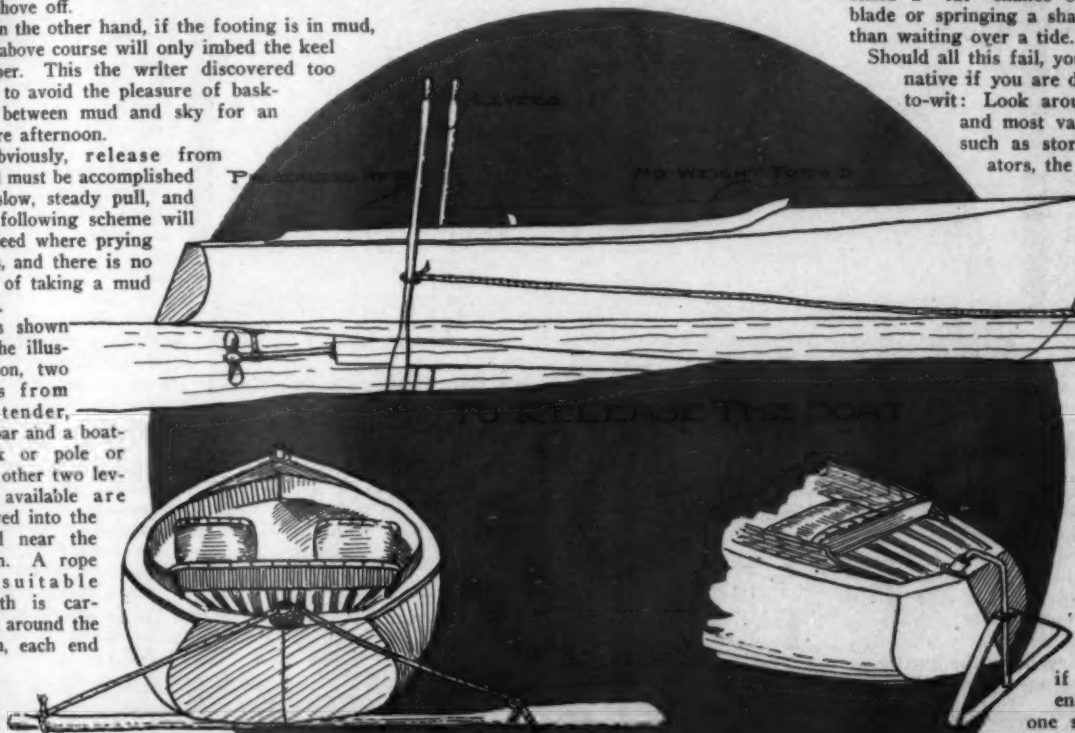
both forward and aft at once, and you can always tell where she is fast by the feeling of buoyancy at the free end; so that should the above first-aid methods fail, rush your party forward if she has struck aft, or vice versa, as the case may be. Then back off with the reverse. If this does not work, and the tide is not falling too fast, you can carry a sizeable anchor out astern in the tender, the further the better, and "kedge off" by hauling on the line by hand or exerting a powerful pull with the windlass, if you have one, helping meanwhile with the reverse.

Care must be taken in using the reverse where the bottom is uneven or covered with boulders, for under such conditions you will stand a "fat" chance of losing a propeller blade or springing a shaft—a worse calamity than waiting over a tide.

Should all this fail, you have but one alternative if you are determined to get off, to-wit: Look around for the heaviest and most valuable things aboard, such as storage batteries, generators, the flywheel, one or two feminine guests, etc., and heave them overboard, the extremes that you will go to in such circumstances

depending on your haste and bank account. By this time the tide will have fallen enough for walking.

Now, it must be borne in mind that very little force is required to keep a boat on even keel, but that the heeling force becomes greater the further she tips over. Now, if your craft is flat enough, she can lie on one side without damage if the bottom is at all reg-



TO PREVENT CAPSIZING

A PERMANENT DEVICE

Method suggested by Mr. Huestis for getting a small boat off a shoal by means of two oars and a line.

ment you strike, close the throttle long enough to pull in the reverse, and then open right up. By this time the stern wave has slid in underneath her, contributing a momentary buoyancy, she gives a slight lift, and with two or three bumps is back into deep water.

If the bottom is mud, and has shoaled up slowly, you can usually back off by promptly reversing with the helm held straight astern.

Now, there are very few boats that ground

ular, but if not there are three methods that can be pursued, separately or in conjunction.

The simplest and surest, if the bottom is not too soft, is to brace some convenient board, such as hatches or seats out of the tender, on either side, with one end on the bottom and the other under the guard or sheer moulding. If your yacht has a strong mast and rigging, anchors may be planted abreast and lines run up to the masthead and hauled taut. If the boat is small, stones may be carefully piled under the bilge, but this is risky.

To sum up: Make prompt effort to back off, and failing in this, unless she is too long-legged, let her lie over on the bilge, light your pipe, compose yourself with a good book, and be patient—there never was a tide that went out that did not come in again.

FRANK P. HUCKINS, Boston, Mass.

He Who Hesitates is Lost.

IF your boat grounds on a falling tide do whatever you are going to do *right away* or you'll stay there a while. Don't stop your engine—reverse the propeller. If your bow is on, don't run forward with a pike pole or an oar, but get way aft and get everybody else there, too. This will tend to lift the bow of the boat as indicated in dotted lines in Fig. 1. But if it is still fast and you can't get a bottom to push on, run forward, jump overboard, and push. Each one off the boat lightens it just so much, and one can really lift and push a pretty sizeable boat. By all means get those who remain on board to "list her over" all they can, for this, too, raises the boat from the bottom. Figs. 2 and 3 are submitted to show the lifting effect of listing. Fig. 3 also shows all there is to the capsizing proposition, if on a flat bottom, for this is about as far over as any motor boat will go when left high and dry.

If the skeg is aground or you are aground amidship, listing and getting overboard and lifting and shoving with the aid of the engine are about all that can be done to get the boat off. If there is a tender in tow, by all means get into it all of the passengers who are afraid of getting wet, to relieve the boat of their weight, especially the heavy ones. Don't waste any time trying to row a dinghy and use it as a tug. Kedging, that is, placing an anchor off in the direction you wish to move, and then hauling in on the line, is too slow a process to use on a falling tide.

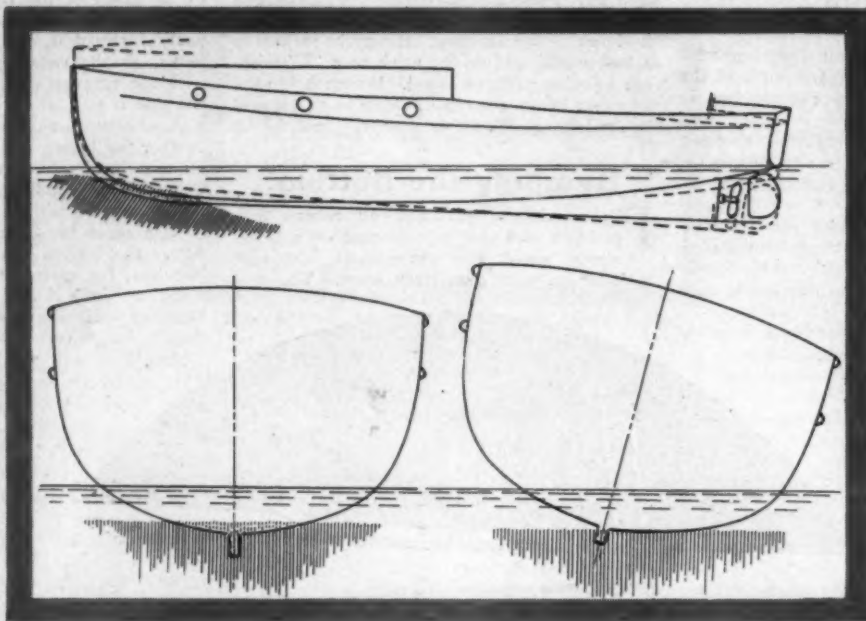
We have said that there is no danger of capsizing on a flat bottom, but if you are on a convex rock the situation is different. It is easier to get off of such a rock, but if you can't get off the condition is serious and you are justified in taking extreme measures to keep right side up. Explore the bottom and decide first which side is the best to list on. Then, if possible, get at least two braces from the gunwale or from the port holes to the bottom. Floor boards, or perhaps a cabin door, will do for this. Then get a heavy anchor off the opposite side and make its line

get the best results when doing this, throw in the clutch suddenly for a moment and then release and throw it in again for another moment. These sudden starts always seem more effective than a steady pull, although, if she is hard and fast, the chances are that these efforts will produce very little results.

Another plan and a good one, provided the boat is not too large and heavy, is to get overboard and push her off. One man will do more this way than half a dozen trying to help her off with oars or boathooks. In this case, provided there are more than one aboard, the engine may be used to assist, but don't make the mistake of all hands going overboard with the engine running without a line of some sort in case you do free her. If she fails to float in this way another and probably the real way is to kedge her off.

Break out the heaviest anchor and row off in the dink as far as the cable will permit before dropping the anchor, and get back aboard and heave away on the cable. If the boat has a capstan, lead the line to it, if not, rig up a tackle and get as heavy a strain on the line as possible and then surge on it, first making all hands get aft so as to take the weight from the bow to the stern, which is still afloat, and have one or two, if possible, get overboard and lift and at the same time push on the bow with all their strength, also using the engine if there is no danger of the wheel coming in contact with rocks. Rocking the boat may help some if you are certain that the bottom is sandy or gravelly, but in the case of its being rocky great danger would be incurred of damaging the planking.

(Continued on page 52.)



Sketch submitted by V-Bottom to illustrate what happens when a boat runs aground.

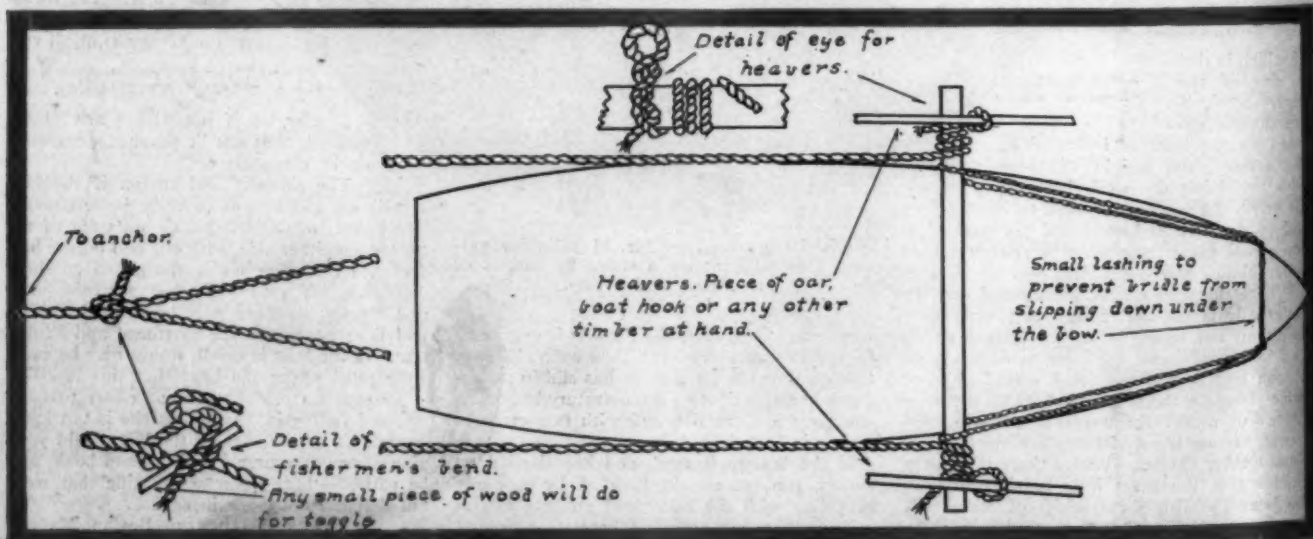
fast to a point as high up on the boat as possible, to its spar if it has one, for example. If the spar is a light one it can be reinforced by a floor board, or possibly an oar, and the anchor rope carried down to the side of the boat and made fast as a further reinforcement.

V-BOTTOM, N. Y. C.

The Spanish Windlass.

THE first thing every one will naturally do when he has the misfortune to run his boat aground is to reverse the engine and try to get her off that way. To

stan, lead the line to it, if not, rig up a tackle and get as heavy a strain on the line as possible and then surge on it, first making all hands get aft so as to take the weight from the bow to the stern, which is still afloat, and have one or two, if possible, get overboard and lift and at the same time push on the bow with all their strength, also using the engine if there is no danger of the wheel coming in contact with rocks. Rocking the boat may help some if you are certain that the bottom is sandy or gravelly, but in the case of its being rocky great danger would be incurred of damaging the planking.



Arrangement known as the Spanish windlass, means suggested by Mr. Crawford, for releasing a boat from a shoal.

A 60 Foot Government Tender



Perry is a fast, powerful dredge tender

PERRY is a dredge tender in service in waters adjacent to Jacksonville for the United States Engineering Department, having been built last season at the yards of the Mathis Yacht Building Co., of Camden, N. J. She has an overall length of 60 feet, a beam of 15 feet and a 5-foot, 6-inch draft. Powered with a 110 h.p., four-cylinder Globe motor having cylinder dimensions of $10\frac{1}{2} \times 12$ inches, she makes a speed of 11 knots, with her 50-inch propeller turning 300 r.p.m. The motor is designed to run on either gasoline or kerosene, and is controlled from the pilot-house or from the engine-room as desired. Two persons may find sleeping accommoda-



in use in Jacksonville waters.

tions in the pilot-house, and the engine-room is also fitted with two berths. The gasoline tanks, which are located in a separate compartment forward are four in number and have a combined capacity of 468 gallons. In the after hold is a tank for fresh water of 234 gallons' capacity.

As might be imagined, a boat of this kind designed for general tender service is of heavy construction. The keel is of 8 x 10-inch oak, and the frames, 3 inches square, are also of oak; the planking is of 2-inch stock, and the decks are of $2\frac{3}{4}$ -inch pine. The deck fittings comprise a cast-iron towing bitt, windlass and other necessities, and Perry is provided with a derrick, mast and boom.

Photographs by Joseph N. Pearce.



Starboard and port views of Perry's power plant. This 60-foot boat is equipped with a four-cylinder, 110 h.p. Globe motor, having cylinder dimensions of $10\frac{1}{2} \times 12$ inches and turning at 300 r.p.m. An idea of her constructional strength may be obtained from the upper picture.



AMERICAN MARINE MOTORS



A New Fulton 6-Cylinder Racer.

A FOUR-CYCLE, high-speed model recently placed on the market by the Fulton Mfg. Co., of Erie, Pa., is a six-cylinder engine with bore and stroke of $4\frac{1}{2} \times 5$ " developing 35 h.p. at 800, and 57 h.p. at 1,300 r.p.m. All moving parts except the flywheel of this T-head engine are enclosed.

the reverse gear and thrust being fully housed.

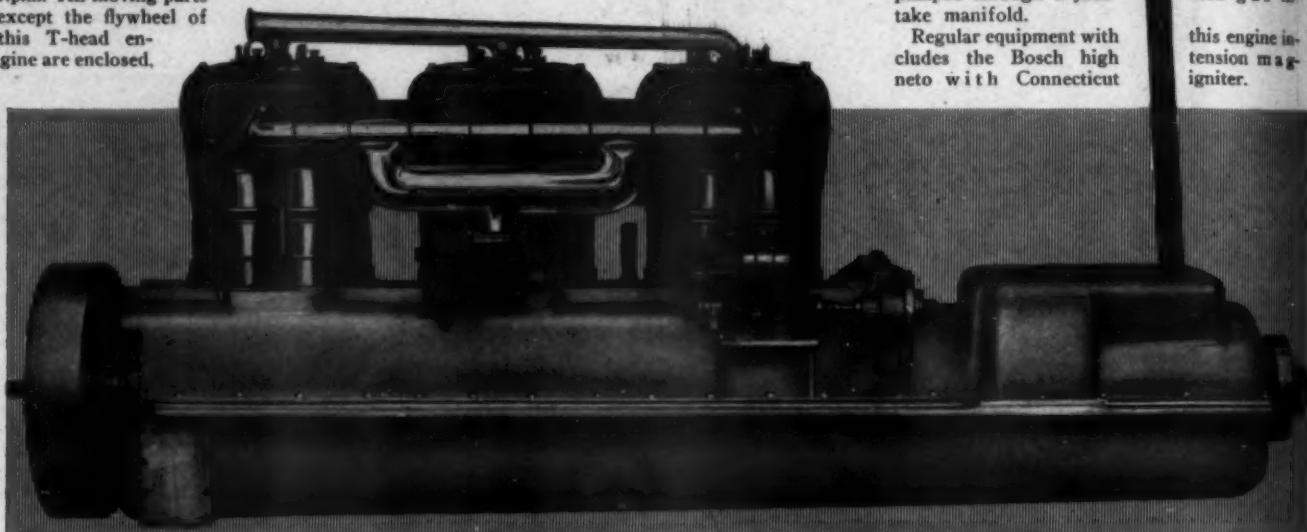
The oiling system is one of the unique features of this machine, lubrication being of the forced feed circulating type, with the oil pumped from the supply tank at the front to

all main bearings, then flowing through a hollow crankshaft to the connecting rod bearings, finally draining into the pan for filtration and re-use. To keep the oil too hot on long, continuous runs, it is pumped through a jacket manifold.

Regular equipment includes the Bosch high neto with Connecticut

from getting out gas in-

this engine intensification magnifier.



This high-speed Fulton engine has been brought out to meet the demand for a small, high-grade, six-cylinder engine for runabouts and day cruisers. The cylinders are cast in pairs, and the engine is beautifully finished.

Type QM 4-Cylinder Wisconsin.

Having, Instead of Intake Manifold, a Cored Passage in Cylinder Walls for Ingoing Gases. Motor Breathers in Valve Stem Chamber a Novel Feature--Accessibility a Big Advantage.

ONE of the most interesting of the new marine motors manufactured by the Wisconsin Motor Mfg. Co., of Milwaukee, Wis., is Type QM, having four cylinders, with a bore of $3\frac{1}{4}$ " and a stroke of 5". Accessibility is one of the most striking features of this motor. Valves, pistons and cylinder head can be easily cleaned by removing the cylinder head casting. Connecting rod bearings can be examined and adjusted through large hand hole plates. The cam shaft may be readily removed from the motor in a few minutes by removing the gear case cover.

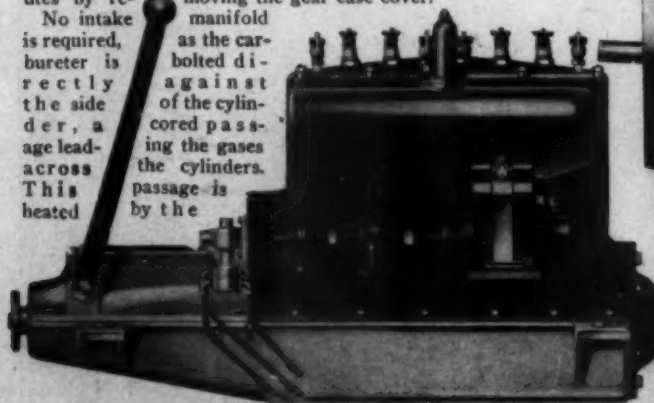
No intake manifold is required, as the carburetor is bolted directly against the side of the cylinder block, a passage leading across the cylinders. This heated passage is by the

water circulating around it, thus facilitating carburetion. The exhaust manifold is on the opposite side of the motor from the intake and does not interfere with any of the other parts. It is bolted to the cylinder.

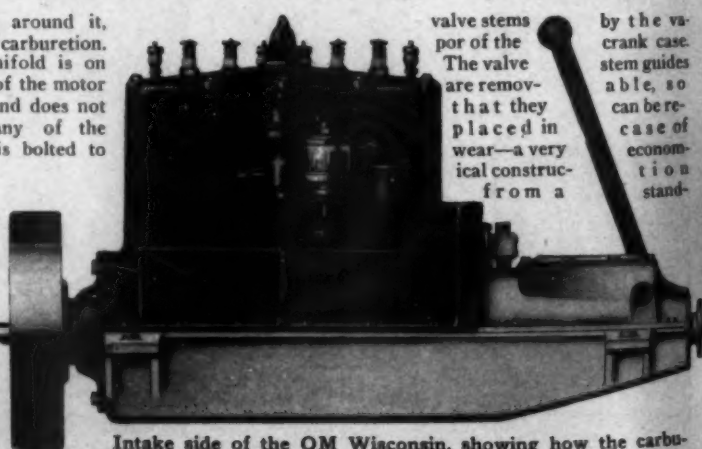
The breathers on this motor are located in the

valve stems of the motor. The valve are removed that they placed in wear—a very ical construction from a

by the valve stem guides able, so can be case of econon- tion stand-



The clutch, which is in unit with the engine, is of the multiple disc type and grips slowly but firmly.



Intake side of the QM Wisconsin, showing how the carburetor is bolted directly to the cylinder block.

valve stem cover plate, and the breathing action of the motor operates through the valve stem chamber, which insures lubrication of the

point of repairs. The valve tappet guides are separate castings and can be easily removed, being held in place by means of a forked crab forging. By loosening this crab the complete tappet assembly, including guide, can be taken out without disturbing other parts. A removable metal plate covers the valves, which keeps them free from dirt and also quiets the action.

The shaft runs in a straight line from the engine shaft and is rigidly supported on the rear by a large New Departure ball bearing.

The 30-40 H. P. Strelinger.

A Heavy-Duty Four-Cylinder Engine Designed for Reliable, Economical and Extended Service. No Weight-Saving Attempted at Risk of Impairing Its Ability to Stand Up Under Hard Work.

FOR fifteen years the Strelinger Marine Engine Co., of Detroit, Mich., have been manufacturing four-cycle heavy-duty marine engines. In that time they have aimed at achieving reliable, economical and long service for their various models. One of their line which is stated to be doing excellent work in practically every branch of marine service—in cruisers, houseboats, tugs, ferries, etc.—is the 30-40 h.p. model, shown in the accompanying illustration.

This motor has four cylinders cast separately, having bore and stroke of 6 inches. The intake valves are placed in the head and are operated automatically, and the exhaust valves are located on the starboard side. The general design of this motor is that of the other four-cycle Strelinger engines, the construction being simple and strong, and built for high efficiency service of the hardest kind. No attempt has been made to save weight at the possible risk of impairing its ability to stand years of hard service. The crankshaft is of hand-forged steel and the connecting rods of drop-forged steel. There is ample bearing surface and there are convenient devices for adjusting all parts subject to wear, the hand-

hole plates in the base permitting of easy access to the crank chamber.

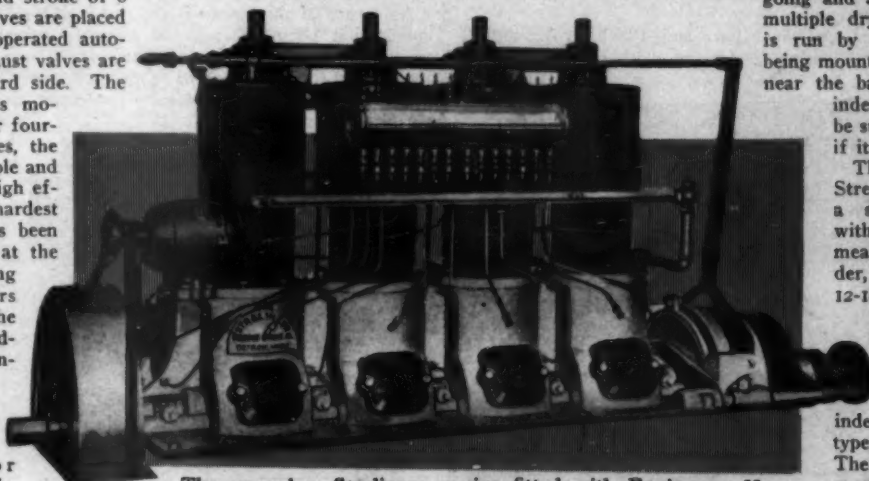
This motor has a 22-inch flywheel turning over 500 revolutions per minute, and the crankshaft is $2\frac{3}{4}$ inches in diameter. The motor weighs 1,951 pounds and measures 68 inches, over all, by a height of 28 inches.

Make and break ignition is regularly supplied, but the jump spark type can be furnished whenever it is desired.

Four separate equipments are furnished with this engine, as follows: Equipment No. 1, con-

sists of bronze water pump of the plunger type, sight feed oilers, air cocks, compression grease cups, starting crank, ball thrust and coupling. No. 2 includes the above equipment, and comprises, in addition, a Kingston float feed carbureter, muffler, bronze propeller wheel, steel shafting, six feet in length; stuffing box, lag screws, batteries, switch, coil and wiring. Equipment No. 3 includes all of the above, and a choice of a standard reverse gear or reversible propeller, while the fourth equipment includes all of the foregoing and a dynamo and Columbia multiple dry battery. The dynamo is run by belt from the flywheel, being mounted on a bracket attached near the base of the forward cylinder. A Remy magneto can be substituted for the dynamo if it is desired.

The other models in the Strelinger four-cycle line are a single-cylinder, 4-6 h.p., with $4\frac{3}{4} \times 6$ -inch cylinder measurements; a single-cylinder, 6-9 h.p.; a two-cylinder, 12-18 h.p., with 6-inch bore and stroke, this engine being of the same cylinder measurements as the 6-9 h.p.; and a three-cylinder machine of the same type, developing 18-27 h.p. The two-cycle line of engines manufactured by this company comprises six models.



The 30-40 h.p. Strelinger engine fitted with Equipment No. 4, including reverse gear, mechanical oiler and dynamo.

The Newest Regal Model.

Rated at 30 H. P. at 550 R. P. M., and Intended to Go in Boats of 40 to 50 Foot Lengths. Water-Cooled Air Compressor Driven Directly Off Engine Crankshaft a Distinctive Feature.

THE Regal Gasoline Engine Co., of Coldwater, Mich., have just brought out a new model cruising boat engine which is rated at 30 h.p. at 550 r.p.m. It is intended

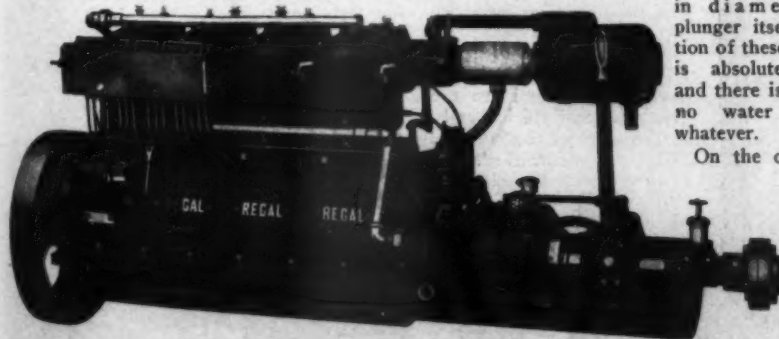
the engine. This is a newly designed pump which is unusually quiet in operation. Both its outlet and inlet valves are contained in the barrel of the pump itself and are as large in diameter as the plunger itself. The action of these large valves is absolutely noiseless and there is stated to be no water hammering whatever.

On the other side of the base extension is the bilge pump which is driven from the same eccentric as is the air compressor.

Though not illustrated in the cuts of the engine, the reversing gear and other moving parts are covered by a gear pan. Just back of the balance wheel and on the port side of the engine the magneto is installed and is driven by gears from the crankshaft.

This motor is constructed so that it can be with a few slight alterations operated upon kerosene as well as upon gasoline. Although the Regal Company have found that the demand for kerosene engines has fallen off considerably since the decrease in the price of gasoline, they state that a large part of the foreign trade, nevertheless, prefer the kerosene engines.

Those familiar with the Regal line of engines during the past years can recognize in this new model 30 h.p. medium-duty engine, a similarity to the old 24 h.p. medium duty.

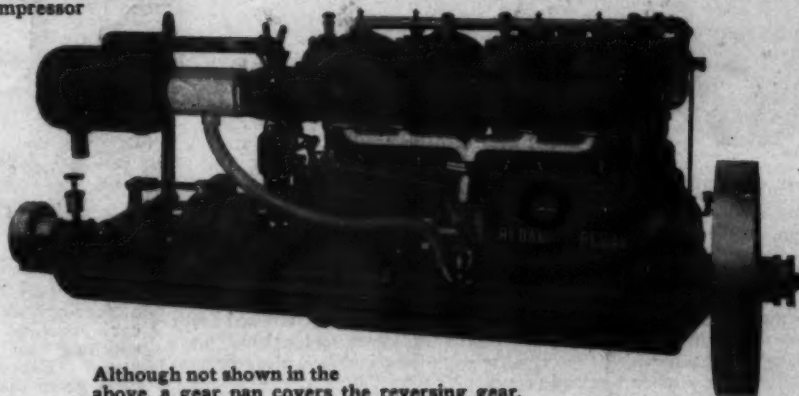


Port view of the new 30 h.p. Regal, showing air compressor and water pump.

to go in boats of 45 to 50-foot length and, though not an extremely heavy engine, is yet heavy enough to stand the ordinary long service which is required in a cruising boat of this size.

The accompanying cuts illustrate the engine and it can be observed that it is similar in many respects to the other Regal engines. The cylinders are $5\frac{3}{4}$ -inch bore by $6\frac{1}{2}$ -inch stroke of the L type, cast singly.

A distinctive feature of the new 30 h.p. Regal is the water-cooled air compressor, just forward of the reversing gear, which is driven directly from the crankshaft of the engine. On the port side is located the cooling water pump which is driven from the camshaft of



Although not shown in the above, a gear pan covers the reversing gear.

4 Novel Motors of Medium Power

The Leech Four-Cylinder, Two-Cycle Motor. Means Whereby Base Compression is Avoided.

THE Leech two-cycle motor which has been recently announced by the Leech Motor Co., of Lima, O., has no crankcase compression, the gases being compressed in separate chambers designed for this purpose. The operation of the motor is as follows: The fuel charge enters a distributor from the carbureter, and as the first piston goes down is admitted through a port into a receiving or mixing chamber which surrounds the piston. Near the bottom of its stroke the piston uncovers another port, which admits a tempering charge of air, forming a maximum charge. The upward stroke of the piston forces the charge out and up through a port into the compression chamber of the neighboring cylinder, the piston in this cylinder being down at this point. The upstroke of the second piston forces the compressed charge into the combustion chamber of the second cylinder. The action of each two cylinders is reciprocal.

This four-cylinder motor has 3-inch bore and 4-inch stroke, and is stated to have developed 30 h.p. at 1,800 r.p.m., with higher power at correspondingly higher revolutions.



The Leech two-cycle motor operates on a principle different from ordinary practice. The cylinder measurements are 3 x 4 inches.

The Holmes-Howard Two-Cycle Tender Engine. Fitted With Joe's Gear and Bosch Magneto.

THE Holmes-Howard Motor Co., of Detroit, Mich., are now marketing a little tender engine of the two-cycle, three-port type which develops 6-8 h.p. and has a range from 200 to 1,500 revolutions per minute. Its normal power output is obtained at 1,200 r.p.m. The motor is furnished as a unit power plant, a Joe's reverse gear being used, and being completely housed in by an extensible aluminum crankcase. Thus all movement of the parts, with the exception of the flywheel, are completely housed in.



This two-cycle motor is intended especially for use in yacht tenders, but it may also be used in runabouts.

The crankshaft is a nickel steel forging, the bearings are extra large, and all parts are interchangeable. Lubrication is effected by grease cups to the main bearings and by mixing oil with the gasoline.

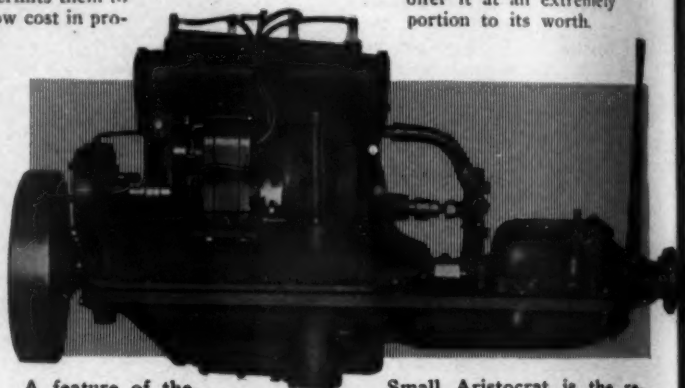
A gear water pump is used, and a notable feature of this motor is the use of a Bosch waterproof magneto with high-tension, waterproof spark plugs. The motor is designed to start easily on the magneto, without the use of batteries. It is shipped completely wired and ready to run on installation after the carbureter, water and exhaust pipes have been connected. The complete equipment includes, also, the propeller shaft, stuffing box and propeller.

The Small Aristocrat, a Unit Power Plant. Four-Cylinder Block Motor Rating 6-9 H. P.

THE Herrmann Engineering Co., of Detroit, Mich., are manufacturing the Small Aristocrat motor which develops 9 to 12 h.p. and has four cylinders measuring 2½ x 4 inches. This motor is regularly equipped with bronze water pump, Kingston carbureter, Berling high-tension magneto, ball-bearing thrust, and double-finger clutch. The camshaft is in one piece, drop forged, hardened and ground, and the crankshaft is drop forged, heat treated and ground. The bearing parts are extra large, the crankshaft being 1 7/16 inches in diameter with bearings for the connecting rods 1¾ inches long. The camshaft measures 15/16 inch in diameter, and has a gear bearing 1½ inches in diameter and 2½ inches long. Other wearing parts are similar in proportion, yet the weight of the motor is kept down to under three hundred pounds.

A feature of this motor is the removable cylinder head whereby the combustion chambers may be cleansed of carbon with very little trouble or time expenditure. The gearset is mounted in unit with the motor, and the whole job has a decidedly neat appearance.

The makers state that quantity production of this one type of motor permits them to offer it at an extremely low cost in proportion to its worth.



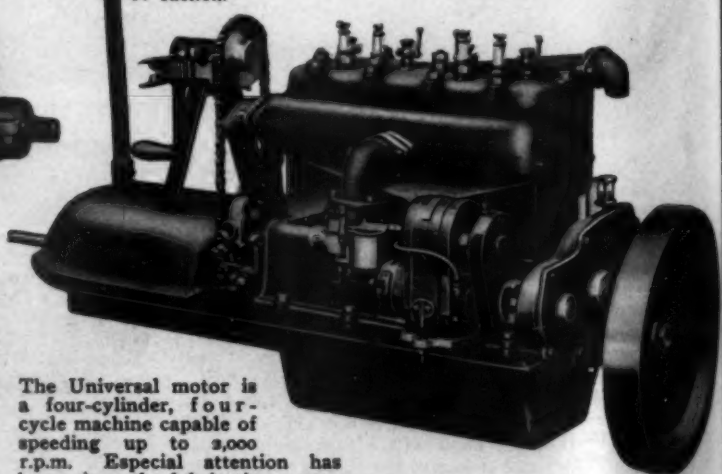
A feature of the Small Aristocrat is the removable cylinder head, whereby carbon may be removed with minimum trouble.

The Universal Motor—For Runabout Service. Developing 6-8 H. P. at 1,000-1,400 R. P. M.

THE Universal Motor Co., of Oshkosh, Wis., have recently brought out a four-cylinder block motor for use on runabouts from 16 to 24 feet in length. Before determining on the best size for their motor, they made a careful survey of boatmen's requirements and decided that from 6 to 8 h.p. was the most desirable size. The Universal motor is supplied, therefore, in the one size only—6-8 h.p. It is of the L-head type, and the valve-actuating mechanism is kept noiseless and dirt-free by a removable metal plate.

The cylinders measure 2½-inch bore by 3½-inch stroke, and the motor is capable of speeding up to 2,000 r.p.m., at which speed it develops about 10 h.p. Die-cast bearings and a special steel crankshaft accurately ground are used, and the crank pins are 1¼ inches in diameter and 1½ inches long. The camshaft is in one piece, and the tappets are of the mushroom type. A front or rear starting crank is furnished.

Especially attention was given the oiling system in the design of this motor, and the plunger is positioned vertically and set well down into the oil bath to insure against loss of suction.



The Universal motor is a four-cylinder, four-cycle machine capable of speeding up to 2,000 r.p.m. Especial attention has been given the lubricating system.

From Motor Boating Readers

This department of MoToR Boating is maintained for the purpose of giving its readers opportunity to ask questions, reply to other correspondents' communications and submit ideas, suggestions, opinions or experiences which may be of interest and assistance to motor boatmen. There are no rules governing the department other than that postage must be enclosed when an answer by mail is desired, and that the name and address of the writer must be given in each instance. No anonymous contributions will be considered for publication, but initials or a pseudonym will be substituted for the writer's own name if the request be made. The editor does not, of course, hold himself responsible for statements made or opinions expressed by contributors to this department.

Racing by the Point System.

To the Editor of MoToR Boating, Sir:
We would like to get from you a suggestion or schedule of points to be used in a series of races for points, which we propose to hold this season, the boat getting the highest number to be awarded a prize at the end of the series, also the second and third. We thought of having, say, the first five rate is points for each race. We are planning to have the best season of racing in the history of the club and have a live regatta committee.

E. E. C., New Haven, Conn.

[We believe the best method of scoring points in series races is as follows: The winner of the match shall be determined by the point system; each boat starting and finishing a race of a match receives one point for the entry, and one additional point for each boat which she defeats, the winner being the boat scoring the highest aggregate number of points in all of the races of the match. In computing points, the maximum number of entrants for the match shall be deemed racing each day, and those that do not start shall be counted as defeated boats. A boat which starts in a race, but does not finish, before one hour after sunset, shall receive no points for that race, but shall be counted as a defeated boat in that race by the boats finishing.]

Navigating in the Fog.

To the Editor of MoToR Boating, Sir:
Will you kindly inform me in regard to the following, since, being greatly interested in your recent remarks on navigation, I find myself in need of further information.

First, how much "into the wind" can a sail vessel go? That is, how near to the direction from which the wind is blowing, when "close hauled" or tacking? Second, in a fog situation, wind from northwest, and a motor boat or steamer on a course due west hears one blast of a fog horn right ahead, what direction is the sail vessel moving, and what course and direction should the motor boat of steamer take? Third, in such situation, could it properly be said that the steamer or motor boat should pass under the stern of the sail vessel?

F. R. W., Syracuse, N. Y.

[In regard to the question of how close into the wind a boat can sail, this depends largely on the type of boat, and the man who is sailing it, as you probably know. An America Cup boat could probably go within 3½ points of the wind, but the average sailing yacht with fore and aft rig, having a perfectly balanced sail plan, whose sails fit perfectly, and whose shape of underbody is right, cannot sail within four points and make any headway through the water. A square rigger cannot go within six to eight points of the wind.

In the fog situation which you have mentioned with the wind northwest and the sailing vessel giving one blast on her fog horn, you will see that the course of the sailing vessel must be somewhere between due west and southwest, to be on the starboard tack. No matter what direction she is sailing, she has the right of way over the

motor boat, which is coming up from astern and holding a course due west. It is the duty of the motor boat to keep clear, not only for the reason that the motor boat must give way under all conditions to sailing vessels, except when the latter is overtaking the motor vessel, but also because the motor boat is the overtaking vessel in this case, and the overtaking vessel never has the right of way under any conditions.

In the situation which you have mentioned, it is the duty of the motor vessel to be kept under absolute control not only after she has heard the fog signal of the sailing vessel, but at all times when navigating in the fog, whether there is another vessel known to be in close proximity or not.]

Painting Steel Hulls.

To the Editor of MoToR Boating, Sir:
Will you kindly advise me as to the best method of treating a steel hull, the paint on which has worn off in spots and the metal has become somewhat rusted? We have tried out numerous lead paints without much satisfaction. M. W., New York City.

[First—The hull should be thoroughly cleansed by using a stiff wire brush, and scrubbed thoroughly. If rusted in any place, it should be sanded down with sand paper or a rough wire brush until all signs of rust have been removed and surface is bright. Then apply two or more coats of red lead in oil, after which paint any color you require, using any paint except copper or bronze paint. Under no circumstance should copper paint be used on steel hulls.]

A Converted Cape Cod Cat.

Comfort, convenience, utility and moderate speed are expressed in The Folly, a 36-foot Cape Cod catboat, built by Herreshoff. Originally the boat was under sail and her former owner stated that she had been to Bermuda under sail three times. Later she was equipped with a two-cylinder two-cycle marine motor of 25 h. p. The present owner, Captain S. A. Miner, of Hartford, Conn., in addition to being a follower of the water is a successful automobile dealer. When he acquired The Folly he substituted a 1907 model six-cylinder 66 h.p. Pierce-Arrow motor which he took from a car.

The Folly is an example of the fact that an automobile motor can be successfully employed for marine purposes, and this is how Captain Miner accomplished the purpose. It is conceded that where an automobile motor is reversed as to position, that is, having the flywheel forward, good results cannot follow by reason of the severe thrust on the end bearings. In the Pierce motor, as in all other motor car units, the larger bearing is at the rear or flywheel end. It is sufficiently husky to stand the thrust. Captain Miner placed the Pierce-Arrow motor in the boat in exactly the same position it occupied in the car, namely, with the flywheel at the rear. Thus the heavy rear main bearing is abundantly able to take the thrust. Between the engine and the Baldrige reverse gear is a telescoping universal joint which also compensates for thrust. In addition, thrust bearings are used. Now then, with The Folly's motor turning to the left it is obvious that a left-hand wheel was necessary. Right here is the answer to those critics who contend that an automobile engine cannot be used in a boat. Operate that motor under the same conditions as in the car, and there you are. The Folly is a remarkably smooth running boat.

Resource of the owner is everywhere expressed about The Folly. For instance, there is a stack. What is it for? Why, it contains a cylindrical 50-gallon copper water tank. The muffler, anchored on springs, passes up through the center of the tank. The muffler is a regular Pierce-Arrow device. A Jericho two-tone gas whistle is secured to the outlet. The exhaust manifold has been changed end for end, outlet looking up at the forward end and leading to the stack. This is covered with asbestos applied over wire springs and ¼-inch mesh wire screen. A gear pump is used for water circulation and an extra pump for the bilge. The propeller is a three-bladed type, 24 inches in diameter by 24-inch pitch.

The maximum revolutions of the motor are 650, driving the boat to actual miles per hour in still water, making 2½ miles to the gallon of gasoline. At 450 r.p.m. the speed is 8 m.p.h., 4 miles to the gallon. Last season the boat ran 3,000 miles and the valves were never ground nor was it necessary to remove carbon. Several times the boat has run for fifteen hours at a stretch and not a cent had been spent throughout the season for repairs.

There are two 50-gallon fuel tanks, one forward and the other on the starboard side aft. A 50-gallon water tank is carried under one of the rear seats. Running water is provided in the cabin, which, by the way, is a roomy affair. The engine is covered with a mahogany table top, and the side leaves, which drop, can be set up when it is desired to use the same as a table. The galley is forward.

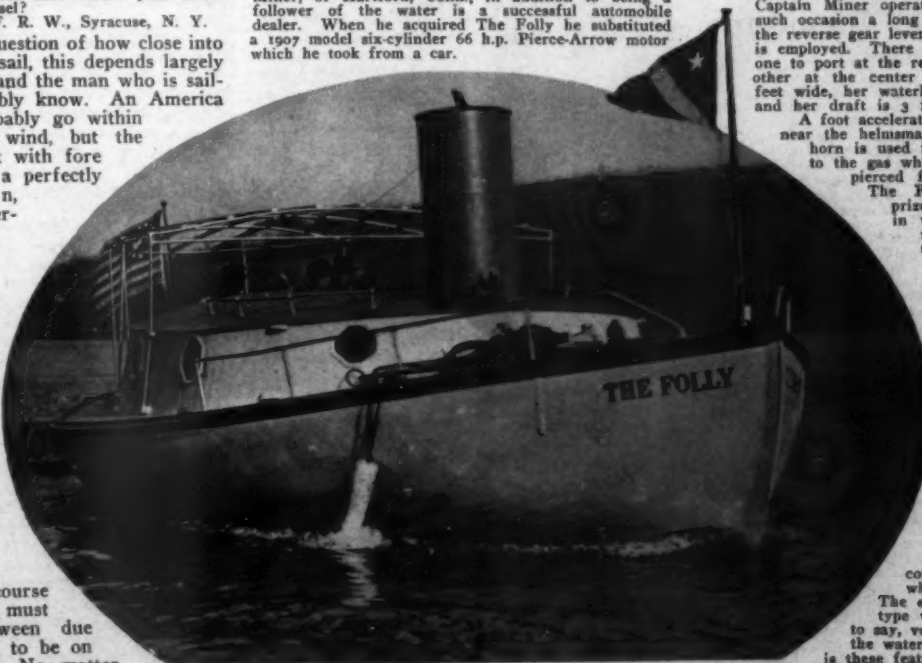
A feature suggested by automobile practice is the control dash back of the flywheel. This is mahogany and on it are mounted the coil, spark and throttle levers and gas tank. The clutch is locked permanently in the balance wheel. At times, Captain Miner operates the boat alone. On such occasion a long rod which reaches from the reverse gear lever to the end of the cabin is employed. There are two steering wheels, one to port at the rear of the cabin and the other at the center aft. The Folly is 14 feet wide, her waterline beam being 10 feet, and her draft is 3 feet.

A foot accelerator is located in the floor near the helmsman's position. A Klaxon horn is used for signaling in addition to the gas whistle. The cabin roof is pierced for brass ventilators.

The Folly has captured the prize trophy in every event in which she has been entered. Captain Miner intends to enter her in the New Rochelle-Block Island 100-mile race in June for the Lipton cup. She flies the colors of the Hartford Yacht Club. Captain Miner, who has followed the Connecticut River and Long Island Sound and adjacent waters all his life, regards The Folly as a comfortable one-man boat.

A boat of this type is not only seaworthy and perfectly safe in any kind of a sea which she is apt to run up against, but makes one of the most comfortable cruising boats which it is possible to find. The extreme beam makes this type very roomy and, strange to say, very easily driven through the water at moderate speeds. It is these features which make the old sailing craft so popular today for motor installation.

WM. S. JOHNSON, Hartford, Conn.



The Folly, a 36-foot Cape Cod converted catboat powered with a 66 h. p. motor.



Calypso, a 32-ft. raised deck cruiser, built by Mr. C. T. Jones, of Chattanooga, Tenn. The builder of this boat, who also drew up sense, having never seen a cruiser at close constructed some distance from the water, and ing his

Speed With and Against the Tide.

To the Editor of MoToR Boating, Sir: Please give me answer to the following, viz.: If a boat makes twelve miles per hour in still water, what will it make going with a current of four miles per hour? There has been quite a discussion with some of my friends as to the different speeds; some insist that it will make sixteen miles per hour and others claim that it will only make fourteen. We have decided to leave it to you.

U. H. M., Savannah, Ga.

[We can see no reason why it should not make sixteen miles per hour when going with a four-mile current. Perhaps the difference of opinion among your friends is due to the fact that when a boat goes a certain distance against the current her average speed for the entire run will not be the same which the boat is capable of in still water. This might be illustrated with the following example: Suppose you had a boat which was capable of a speed of four miles an hour in still water, and you sent her down stream for eight miles, going with a four-mile an hour current. Naturally, it would take her exactly one hour to make the down stream run, but when she turned about and endeavored to come upstream against the current, she would not be able to do so, as the strength of the current and her speed being equal, she would remain in the same spot, and never be able to return to the starting point. Consequently, her average speed for the round trip would be 0 miles per hour, yet the boat is capable of going four miles an hour in still water. As the speed of the current approaches the speed of the boat, the slower will be her average speed over a run for a given distance with and against the current.]

Length Is an Important Factor.

To the Editor of MoToR Boating, Sir:

I read with a good deal of interest Mr. Chapman's strikingly illustrated article in the February number, relating to the speeds of hydroplanes and fast displacement racers. The data he submitted and the remarkable accuracy with which the points lay within, or close to, the curves as plotted, certainly seemed a very convincing argument that length had nothing to do with speed in a boat of this type, and was dependent almost wholly on weight and horsepower. As I am, however, very much "from Missouri" on this speed proposition, I have taken the trouble to check up this curve with boats within my own experience and enclose a photo and data relative to an express cruiser Ouananiche, which makes a speed more than 31 per cent. greater than Mr. Chapman's curve would indicate. This boat was designed by the writer last year, and built by the Church Boat Co. She is 65 ft. long, 9 ft. beam, and her designed displacement is 22,800 lbs. She is equipped with two 6-cylinder, Model C, 5/16x6", Van Blerck motors. This model engine is capable of 116 h.p. at 1,200 r.p.m. This boat was used as an express cruiser between the owner's home, at Trenton, on the Detroit River, to the Old Club, at the St. Clair Flats, a distance by chart of 39.75 miles. Her normal running time between these points was 1 hour 26 minutes up, 1 hour 30 minutes down, or an average of 25.6 miles speed. These runs were not made under racing conditions, there always being a good many people on board. It would certainly be fair to assume she could make 27 miles or better on a mile straight-away in still water, which I suppose is the condition under which the records used by Mr. Chapman were made. However, to be conservative let us call the speed of Ouananiche



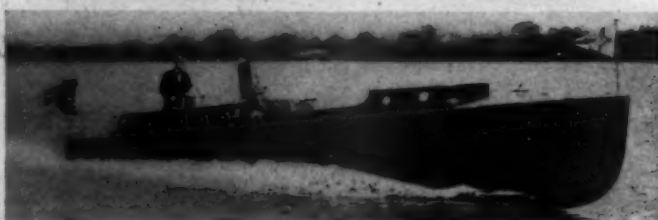
25.6 miles, then with 22,800 weight and 232 h.p. her pounds per h.p. would be 98.27. Although the heaviest boat allowed for on Mr. Chapman's curve is 70 lbs. per h.p., we can easily project this curve in the general direction indicated. I have done this and find that at 98.27 lbs. per h.p. the curve calls for a speed of only 19 1/2 miles. In other words, Ouananiche with a speed of 25.6 miles beats the curve by 6.1 miles, or better than 31 per cent.; or, taken in another way, according to the curve, she should not have exceeded 47 lbs. per h.p., or less than half what she does weigh, in order to make the speed she does.

This would seem to indicate either that the performance of Ouananiche is very remarkable or that Mr. Chapman's curve is "off," except in connection with boats of practically the same length. What's the answer? Is she a wonderful boat, or is Mr. Chapman's curve wrong?

I have had so much experience with this speed proposition and know so well the folly of drawing hasty conclusions from a few examples, that I believe it would be of great advantage and interest to your readers if you could secure and publish the "dope" on other fast boats. I would like especially to know how Mr. Hand's Flyaway III measures up with this rule.

C. W., Detroit, Mich.

[We are afraid that the article in our February number may have misled you somewhat, as we had no idea of meaning that the data as shown by the curves would fit boats of all lengths. We had in mind boats of such a size as are generally used for racing purposes in the east at the present time, that is, racing boats of under 35' in length or thereabouts. We agree with you perfectly that length is a



Upper view shows Ouananiche, a 65-footer, powered with two 116 h.p. Van Blerck motors; lower view is Bo's'n, a 45-footer, powered with one 116 h. p. Van Blerck motor. Both of these boats were designed by Carlton Wilby, built by the Church Boat Co., and each is capable of a speed of 27 m. p. h.

by Mr. C. T. Jones, of Chattanooga, Tenn. his own plans, is an amateur in the truest range before he built this one. It was con- the illustrations show his method of launch- craft.

very important factor, especially when you are comparing 65-footers with 16 or 20-footers, which a majority of the boats were in our illustrations.

However, we are sorry to note that you feel that our conclusions were hasty and based on the few examples, for this is far from the case. The data from which we plotted these curves was derived from the performances of many hundreds of boats, but as MoToR Boating is an illustrated magazine, it was only possible to show about 14, by the method which we adopted. We are absolutely sure of our figures, as the weights given were actual scale weights, and not designed displacements taken from the lines of the boats. The horsepower values were taken from accurate tests and not from the manufacturers' ratings. We are always very particular not to take anyone's say-so as to the truth of the statements of weights and of powers, unless we were present at the time the boat was weighed and have timed the boat in a number of trials over official courses. By adhering to such a policy is about the only way we know of, of arriving at conclusive results.

You certainly have a wonderful boat in Ouananiche, and judging from the data which you have given us it is about the best we have ever heard of. While we do not wish to let you think that we doubt your figures, in the least, we note that you say your designed displacement is 22,800 lbs. In our study, we did not accept any figures of designed displacements as we found that in every case the actual weight differed considerably from the designed displacements, sometimes as much as 25%. If your boat has never been weighed, we do not think it right for you to draw conclusions that our curves are wrong until you have actually weighed the boat in question. We also note that you say you are getting 116 h.p. out of this motor at 1,200 r.p.m., but you do not state at what speed you are running this motor when she makes the speed of 25.6 miles an hour. We understand that it is possible to get 130 h.p. out of this motor at 1,200 r.p.m., and considerably greater h.p. at a larger number of r.p.m.

While we have no reason to doubt your figures of the distance between Trenton and the Old Club, yet we have no way of checking this up, as the only chart of this section which we have in this office is rather large scale and gives neither of those points, but we believe the only way to get accurate speed is by putting the boat over a mile course several times, with and against the current, and timing her with a stop watch. Owners, and especially mechanics, are very liable to exaggerate the length of the course and the speed of the boat, not on purpose perhaps, but because the length of the course, they have been told by someone, is such and such a length, and they have never checked it up.

In regard to Flyaway III, this boat weighed a trifle over 10,000 pounds on the scale in racing trim, and her motors developed 120 h.p. at the revolutions they ran at, and a speed of 22 miles an hour was obtained.

Among the Clubs

Clubhouse and landing of the Corinthian Yacht Club of Philadelphia at Essington, Pa.

Power Squadron Activities.

At the annual meeting of the United States Power Squadrons, held recently in New York City, delegates were present from all local Power Squadrons, and many from Squadrons in the process of formation. From the enthusiasm shown at this meeting it is evident that the Power Squadron movement is becoming very popular and gives promise for a successful season. The following officers were elected: Chief commander, Roger Upton, Boston; vice-commander, Charles F. Chapman, New York; rear commander, Charles F. Longstreth, Philadelphia; secretary, Frank W. Wardwell, Portland, Me.; treasurer, John K. Murphy, New Haven, and members at large of the Governing Board, Theodore I. Coe, New York; Frank S. Cornwell, New Haven; Ogden T. McClurg, Chicago, and Worthington Scott, New York. The Committee on Rules includes C. Neal Burnell, Boston; Arthur F. Forbes, New Bedford; and Burton R. Miller, Boston, and the Committee on Instruction and Examination includes N. L. Stebbins, Boston; William A. Hopkins, Boston, and Worthington Scott, New York.

Rear Admiral N. R. Usher and Lieutenant Craft were in attendance representing the Navy Department, and Deputy Commissioner A. J. Tyrer, of the Bureau of Navigation of Washington, D. C., represented the Department of Commerce. Commissioner Tyrer, in his report to the delegates on the Department of Commerce's attitude toward the Squadrons, read the following letter from the Navigating Officer having charge of the boat detailed by the department for the inspection of motor boats in the federal waters in this country.

"Commissioner of Navigation,
Washington, D. C.

"Sir: "Referring to your request for a report as to the result of the agreement entered into between the department and the power squadron of the Boston Yacht Club, whereby the vessels of that squadron were relieved from inspection in view of the agreement that such vessels were to be inspected by officers of the power squadron, and to be kept fully equipped and navigated according to navigation laws, I take pleasure in stating that, as far as my observation was possible, the said agreement was carried out in a most satisfactory fashion.

"Opportunity afforded on several occasions for me to be on board some of the vessels of the power squadron, and being invited to look about those vessels, I am happy to say that in no instance did I find anything lacking that the law required; generally I found surplus equipment.

"I believe that the arrangement with the power squadron is not only helpful to us and a relief from some annoyance probably to them, but the enlistment of their tremendous influence and co-operation in our work I consider vitally important."

There are at the present time eleven local squadrons already formed, and eight additional ones in the process of formation, some of whose applications for admission to the United States Power Squadrons are now before the Chief Commander. The existing squadrons are as follows: Power Squadron of the Portland Yacht Club, Power Squadron of the Portland Yacht Club, Hudson River Power Squadron, Power Squadron of Narragansett Bay, Power Squadron of the New Bedford Yacht Club, Power Squadron of the Savin Hill Yacht Club, Power Squadron of the Quincy Yacht Club, Power Squadron of New Haven, First Great Lakes Power Squadron of Chicago, Albany Power Squadron and the Power Squadron of Huntington Bay.

The Albany Power Squadron is the last addition to the United States Power Squadrons, having been admitted during the past month. Twenty-three of their members have already passed the examination given by the District Board of Instruction and Examination, and many more members of the Albany Yacht Club are preparing themselves for the examination at this time, so that the prospects look good for a very active squadron on the upper Hudson by the time the season opens. The Power Squadrons of Huntington Bay is another of the local squadrons to be admitted to the United States Power Squadrons during the past month, and the first squadron to be formed on the western end of Long Island Sound. New squadrons in the process of formation are the Huguenot Yacht Club of New Rochelle, Philadelphia, Chesapeake Bay, Washington, D. C., Buffalo and Cleveland.

The object of this squadron movement, as many already know, is to make the motor boatman better able to handle his own craft, and thus promote safety both to himself and to other boats afloat. Another of the objects is to improve the relation between the motor boatman and the merchant marine, and also to make certain that all motor boats are

fully equipped according to the government regulations. Each member is required to pass an examination to show that he is thoroughly capable of handling his own boat, and is a good seaman. Besides this, an oral examination is given on such subjects as rules of the road, proper lights for the various classes of boats to carry, whistle signals, the compass and its use, buoys and other aids to navigation, use of the chart, etc.

Naturally, the exact text of the examination which the applicant must pass to be admitted to the squadrons and to be able to fly the distinguishing flag cannot be made public any more than an examination given by the government for a pilot's or master's license could be. The squadron does not aim to make book sailors out of motor boatmen, but their main object is to make them better able to handle their own craft, both for their own protection and for the safety of others. This could not be, if the applicant knew, word for word, what questions were to be asked of him or had learned to recite the answers sort of parrot fashion to the examiners.

Standardized Conditions for Long Distance Races.

Plans for four of the principal long distance races in the vicinity of New York City have been completed. For many years past any uniformity in the conditions governing these long distance races has been lacking—in fact in some instances after a cruiser had sailed in one of the races, she had to be practically rebuilt and re-equipped to get into the next event. The dates were often conflicting, and in one instance not long ago two of the most important of the races were scheduled for the same day.

With this end in view representatives of the four clubs holding these principal races got together recently in order to draw up a standard set of conditions governing all four contests. Delegates from the New York Motor Boat Club, holding the annual race from New York to Albany and return, from the New York Athletic Club, which manages the ocean race from New Rochelle to Block Island, from the Colonial Yacht Club, which has charge of the annual race to Cornfield Lightship and return, and from the Columbia Yacht Club, which takes charge of the race from New York City to Stratford Shoal and return, were present.

It was agreed that the Albany race should be held on Saturday, June 10th; the Block Island race on Saturday, June 26th; the Cornfield race on July 10th, and the Stratford Shoal race on July 17th.

In each one of the above races there will be a class for cruisers between 28 and 50 feet load water line length, and sanction has been asked from the American Power Boat Association. The measurement in each of these races will be according to Rule V. of the 1915 American Power Boat Association rules, and all competing boats must be measured by the official measurer of the A. P. B. A., or by one of the assistant measurers appointed for these races. The following assistant measurers have been appointed: F. W. Horenbeek, New York Motor Boat Club; L. Huxtable, Colonial Yacht Club; C. O. Gunther, Columbia Yacht Club; R. M. Haddock, New Rochelle Yacht Club.

The crews are to be in accordance with Rule XII, of the A. P. B. A. rules, and the words, "be steered by an amateur" the race committee interpret to include any and all directing of the course of the boat, whether by advice or otherwise. Professional pilots are not to be included in the crew in any capacity. In this class, in each of these races, each boat must be fully equipped according to the 1915 rules and carry on deck or tow a suitable tender, two anchors and cables, lead line, compass, charts and bucket. Power must consist of an explosive engine or engines, operated by either gasoline, kerosene, or alcohol, and no ingredient to increase the power of the fuel will not be allowed. An extra supply of fuel may be taken on en route, provided the boat is not making headway through the water while so doing. The use of sails is prohibited.

Time allowance will be according to the 1915 A. P. B. A. rules, and entries for each race will close three days before the date of the race, at which close all rating certificates must be received. Protime will be in accordance with Rule XXIII, and tests will be awarded according to the number of starters. A special trophy, to be known as the Long Distance Championship Trophy of New York City, has been offered to boats competing in any or all of the above four races. The winner of this trophy shall be determined by the point system, whereby each boat starting and finishing any of the above races receives one point for starting and one additional point for each boat which she defeats, the winner being the boat scoring the highest aggregate

number of points in the above races. In computing points, the total number of different starters in the above races shall be considered as racing in each event, and those that do not start shall be counted as defeated boats. A boat which starts in any of the races, but does not finish, shall receive no points for that race, but shall be counted as a defeated boat in that race by the boats finishing.

An American Power Boat Association record certificate, signed by the president and secretary of the A. P. B. A., will be presented to the boat making the best corrected time in each race.

There will also be other classes arranged for several of these races to meet the local conditions, and boats entering these classes will not be obliged to follow the conditions governing the above standard class for all four races.

New Association Formed at Long Island Sound.

The principal yacht and motor boat clubs, located on the western end of Long Island Sound, have recently formed an association, to be known as the Long Island Sound Motor Boat Association. The object of this association is to promote motor boating in racing and the general welfare of motor boating in that locality, and to formulate and record all data, especially in rating, and the government of trials of speed. The charter members of this association are, the Port Washington Yacht Club, Knickerbocker Yacht Club, New Rochelle Yacht Club, Motor Boat Club of America, Huguenot Yacht Club, and the Stamford Yacht Club. Mr. T. B. Taylor was elected chairman; H. L. Stone, vice-chairman, and H. W. Lowerre, secretary. It is expected that in the very near future some twenty or more yacht clubs, located on the Sound in the vicinity of New York City, will join this association. The Long Island Sound Motor Boat Association will also apply to be admitted as the Long Island Sound section of the American Power Boat Association.

Bronx River Yacht Club Elects.

The Bronx River Yacht Club, at their clubhouse at Westchester Avenue and Bronx River, recently elected the following officers for the ensuing year: Commodore, Arthur Wilson; vice-commodore, Henry Hashagen; rear commodore, John Hartmeyer; fleet captain, Henry C. Schwartz; fleet surgeon, Charles Daub; steward, Thomas F. Phalen; recording and corresponding secretary, Gus W. Graul; financial secretary and treasurer, Bert E. S. Seaman, and sergeant-at-arms, Norman Cornell. The Board of Directors was elected as follows: Frank Bolton (three years), Edward Hicks and Albert J. Wanser (two years), John W. Kingston and Herman Hashagen (one year). The installation of officers took place at City Island, Friday, April 16th, and immediately after a supper was served followed by an entertainment and dancing.

Pacific M. B. C. Plans.

The Pacific Motor Boat Club, of Belvedere, Cal., is planning a very active season for 1915. Commencing May 1st, there will be races, or a cruise, or a clam bake, or some rich festivity every Saturday up to the first of November. This club has instituted a Committee on Reception of Visiting Yachtmen, composed of Messrs. F. T. Bowers, William Letts Oliver, F. A. Robbins, J. S. Hawkins, and W. S. Heger, which will make it a special duty and pleasure to welcome all motor boatmen who go to the coast to the exposition. Mr. Hawkins can be reached at the Standard Gas Engine Company's exhibit, and Mr. Heger at the Busch-Sulzer-Diesel exhibit—both in Machinery Hall. The club extends a very hearty invitation to all easterners who pay heed to the words "Young man, go West," to drop in on them and make the clubhouse their headquarters.

Dinner Dance of the Great Peconic Bay Y. C.

The Great Peconic Bay Yacht Club, of South Jamesport, L. I., held its annual dinner dance at the Lafayette in New York. It was largely attended by members and their friends, and a royal time was enjoyed by all. The applause which followed the remarks of the various speakers—Commodore Ludlum, Dobler, Street, Wunder and Jaques—portends a successful season at Jamesport. The proposition to build a new clubhouse at South Jamesport was received with much enthusiasm, and under the guidance and encouragement of Commodore Jaques, a considerable sum was tentatively subscribed to carry out the project.

New Things For MOTOR Boatmen

New Wisconsin Models.

The Wisconsin Machinery & Mfg. Co., of Hildreth St., Milwaukee, Wis., announce their new rowboat and canoe motor models J and K, called Wisconsin Juniors. While the other five models of the Wisconsin outboard motor line are not by any means discontinued, these motors have been put on the market to meet the demand for a cheaper, light-weight motor. The features of the higher-priced Wisconsin are clearly apparent in these two Juniors—the same power plant, same ignition, and same wide range of adjustment, both horizontal and vertical, being retained. The independent rudder is replaced by a swinging propeller with self-locking tiller. A twist of the tiller locks the propeller in any position and a straight course against the thrust of the propeller can thereby be maintained without any necessity of holding the tiller. Model J is battery-equipped, and Model K is provided with a special high-tension reversible, waterproof magneto.

Safety Gasoline Storage Plant.

The Martini & Hunkeler Company of America, having offices in the Woolworth Bldg., New York, are offering a safety storage gasoline plant for use aboard a motor yacht. In this system to which it is stated that all known principles of safeguarding are applied, an inert gas such as carbon dioxide is used to force the gasoline from the tank to the carburetor. All fuel pipes are jacketed, the outer jacket containing the non-oxidizing gas, and in case of a leak or break in the inner pipe no liquid will escape, as the gas will enter the pipe from the jacket and force the fuel back to the tank. As shown in the illustration the system is in use in a small cruiser. The gas bottle is seen forward of the bulkhead, and the tank, of elliptical cross-section to fit the hold of the boat, is shown under the cockpit. A reducing valve is used to bring the flow of gas from the bottle to the working pressure, and all pipes terminating in the tank are fitted with anti-diffusers to prevent air entering the tank and forming an explosive mixture in case of a break of any of the pipes.

Moteur Universel Amphion.

Under this French cognomen the Amphion outboard motor is manufactured by A. J. Machek & Co., of Milwaukee, Wis. The Amphion, which is modeled after French marine engine practice, is a two-cylinder motor, reversible, fitted with a weedless wheel. One of the distinct features of its design is the arrangement of the cylinders, these being placed vertically. Other features are a one-way friction clutch with which the engine can be allowed to run without turning the propeller, a padlock locking device whereby the motor can be locked to the boat to prevent theft, Bosch waterproof magneto, and Heichkiss silencer and cutout. A tilting arrangement is provided so that the engine can be swung inboard in case repairs are necessary, and the motor, magneto, gasoline tank and clutch are a unit which may be used separately from the part which makes the Amphion a rowboat motor, for use on a country place. Centrifugal pump equipment may be used with this motor for pumping water to the garden or to the house tank.

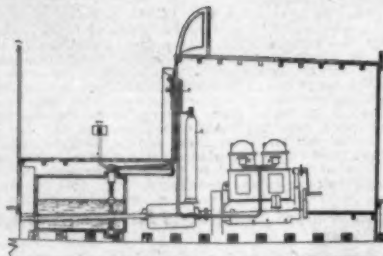
Barbour's Shoal Eater.

The Barbour Metal Boat Co., of East St. Louis, Mo., manufacture the Barbour Shoal Eaters, shallow-draft boats constructed of galvanized sheet steel, in sizes ranging from 12 to 25 feet. When at rest the boats draw only 2½ inches, and they can be run in five inches of water, the propeller turning in a tunnel, and being above the bottom of the boat. These boats are also provided with a weedless tunnel, so that they may be run in shallow water which is thick with weeds. The bottoms are protected by three channel iron runners for the entire length, so that the boats can be dragged for long distances on their own bottoms without leaking. These boats are sold complete or they may be purchased in the knock down, or built entirely at home from patterns.



Model K, the new Wisconsin Junior outboard motor.

Wilhelm piston ring remover.



Plan of the Martini & Hunkeler gasoline system as installed on a cruiser.



The Amphion outboard motor is a two-cylinder machine with vertical cylinders.



One of the Barbour Shoal Eaters.



Volum bilge pump.

The Dandy, Jr. Tender.

The Water Craft Co., of 221 Fulton St., New York City, have just completed and are offering their Dandy, Jr., dinghy, a semi-round ten-foot tender, equipped with a 2½ h.p. motor. This boat, which is illustrated in the accompanying photograph, is capable of carrying four persons safely, and sells complete for \$25. This concern is also offering a handsome mahogany-trim, round bottom rowing tender of light construction, but of large carrying capacity, nine feet in length, which sells for \$75. For detachable rowboat motors, they are building a sixteen-foot special round bottom boat, with extra heavy starboard, selling for \$65.

New Piston Ring Remover.

The Wilhelm-Smith Machine Company, 926 Bingham St., Reading, Pa., make a piston ring remover designed to facilitate the removal or replacement of piston rings having diagonal cuts. The small guards marked A & B are held in position with screws, so that they can be reversed. In this way the same tool answers for rings cut right or left hand. The tool is made from steel throughout. The legs or sides are pressed steel U-shape. The small jaw or hook end that expands the rings is milled, and the tool is well made and finished in dull nickel. The price is \$1.

Sands' New Bilge Pump.

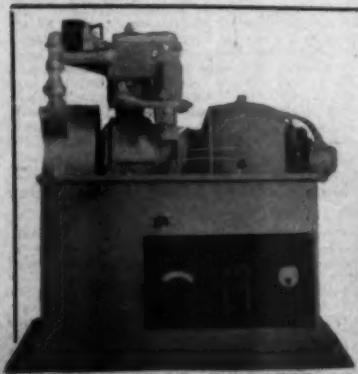
A. B. Sands & Son Co., of 22-24 Vesey St., New York City, have recently perfected and placed on the market a brand new bilge pump known as the Volum. The Volum pump is 28 inches long, having a stirrup handle and wood grip and being fitted with 5 feet of rubber hose and detachable coupling. The chamber is 2 inches in diameter, giving a capacity of one gallon for every four strokes. The pump is fitted with a Sands Special bottom strainer. The Volum pump is listed to sell at two figures—for \$4.50 as described, and for \$5 when fitted with an adjustable foot rest. The chief advantages claimed for this pump are its reasonable price, large size and capacity, easy action and heavy construction.

Matthews Lighting Plant and Electric Capstan.

Two new marine electrical necessities are being produced by the Matthews Boat Co., of Fort Clinton, O., one of which is a direct-connected plant for yacht lighting, similar to the house lighting plant shown in the lower left-hand corner of this page. The marine set will have a special low base for compactness and light weight. The equipment consists of a single-cylinder four-cycle motor of 3 h.p. capacity, connected to a 32-volt generator. The outfit is furnished with either a hand-operated or a full-automatic switchboard. The full-automatic plant starts the engine without any attention from the crew when the batteries have reached a certain point of discharge, and when the batteries have been fully charged automatically shuts down. The equipments are built in two sizes, one a 50-light 1 K. W. plant, and the other a 100-light 2 K. W. These stands are stated to be capable of withstanding a considerable overload. The capstan shown in the accompanying cut is this concern's latest type, consisting of an apparatus made of non-corrosive aero metal. All moving parts are enclosed within the capstan shell, which is ball-bearing throughout. On test the equipment is stated to have made a direct pull of 1,200 lbs. at an average rate of 16 feet per minute, with a current consumption of 750 watts. The weight is only 280 lbs.

Laxine Carbon Remover.

The O-Lax Sales Co., of Paul Jones Building, Louisville, Ky., are distributors of Laxine, a non-acid fluid carbon remover which is designed to operate practically instantaneously by generating oxygen when the fluid comes in contact with the heated metal on being poured into the cylinders, the engine having previously been run until thoroughly hot. The spark plugs are immediately replaced and the engine is left undisturbed for ten minutes or so; it is then started and speeded up and slowed down by means of the throttle in order to blow out the carbon.



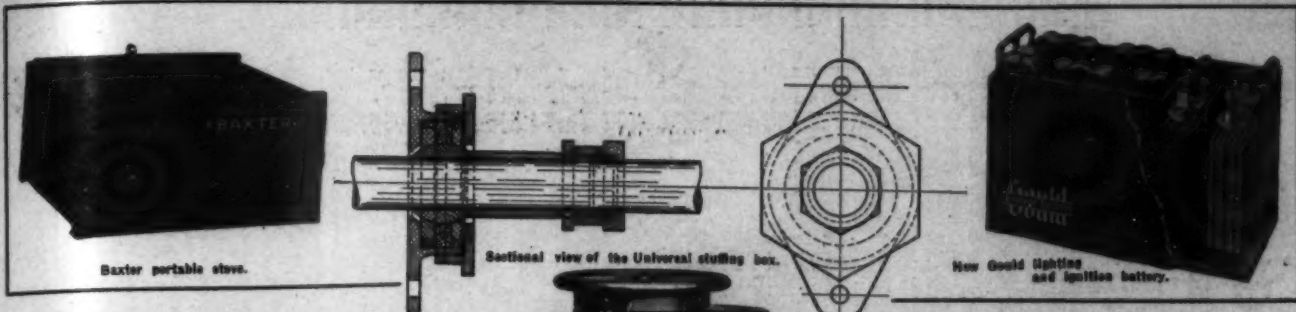
The marine model of the Matthews lighting outfit has a low base.



Dandy Jr., the new 10-foot tender of the Water Craft Co.



Light-weight Matthews electric capstan.



Baxter Portable Stoves.

W. E. Baxter, of Louisville, Ky., makes a portable stove and cooking and serving outfit, designed for the use of vacationers and cruising parties. This consists of a complete stove which, when not in use, is packed in a metal crate support measuring 10½ x 18 x 21½ inches and weighing approximately 25 pounds. Three sections of adjustable stove pipe and two automatic locking bars pack into the fire box compartment, and when needed the whole apparatus may be re-erected on the crate support in a few minutes. The cost of the stove alone is \$7.50.

The Universal Stuffing Box.

Clesie L. Cummins, of 6th and Mechanic Sts., Columbus, Ind., has recently put on the market a stuffing box of his own invention which is designed to permit lateral as well as radial movement of the propeller shaft. The radial action in the Universal stuffing box is obtained by casing the ball-shaped end of the bearing between two circular plates which float between the back or base and the adjusting nut on the forward side. The space in the enclosed chamber is packed with grease which lubricates and keeps out water. In order to obtain the correct alignment, it is only necessary to loosen the adjusting nuts slightly and allow the shaft to spring to the proper place of its own accord. The inventor has found on his own boat that he can shift the shaft about three inches in any direction, and still obtain perfect results, while he can set the plates tight enough to keep out water and keep the shaft from chattering. At the present time deliveries can be made on any size up to 1¾ inches.

The Elite Generator, Model B.

In response to a demand for a generator of higher capacity than the Model A Elite, E. A. Gardner, Box 547, Rochester, N. Y., has announced the production of the Elite Model B, delivering at 1,800 r.p.m. 7½ volts at 8 amperes, or 60 c.p. running direct. This new generator weighs 10 lbs., and measures 7 inches in length by 4 inches diameter by 5 inches high. The case, of white metal, is watertight and will not rust, and the brushes are large and get-at-able. The commutator is in 12 sections with mica insulation, and the shaft of hardened steel, ground to size, runs on ball bearings. Bowden wick feed oilers are used. The price of this outfit in black enamel finish, complete with automatic cutout is \$25, or \$27.50 with ammeter and automatic cutout.

Inland Piston Ring.

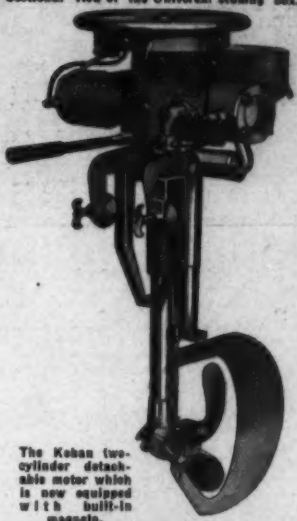
The Inland Machine Works, of Eighth and Mound Sts., St. Louis, Mo., are introducing the Inland piston ring, which is claimed to have all the advantages of the eccentric type of ring because its free ends are gradually tapered for half its circumference and it bears upon the cylinder walls with equal pressure. The ring is concentric, and the openings at the free ends are less than one-third the width of the ring and are at opposite points, while the friction area of the free ends is less than one-half the radial thickness, giving a greater proportion of strength. In use the ring tends to uncoil in a circle; it is heat treated, so that it is in the same condition before use as under service, and the makers state that it will give maximum compression with minimum friction. It is made in standard sizes, the price up to and inclusive of 3¾ inches being \$1.

Lightning Carbon Remover.

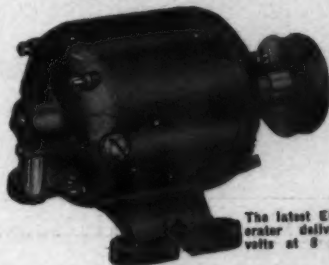
The Grahamline Products Company, of Wilkes-Barre, Pa., are introducing the Lightning carbon remover, which is described as being a fluid absolutely free from acids of any kind and perfectly non-injurious to metal. Its function is to break up and disintegrate carbon deposits, and thus eliminate pre-ignition, with its consequent troubles. The fluid is applied through the spark plug openings while the motor is cold; the next operation is to replace the spark plugs and turn the motor over ten or a dozen times with the switch off. After standing a few minutes the motor is started and run while the throttle is alternately opened and closed, and in a few minutes, it is stated, the carbon particles will be discharged through the exhaust. R. Hoyt Sloan, of 95 Liberty St., New York City, is the company's general representative.

Volta Electric Lighting System.

The Irwin D. Groak Engineering Co., of Monadnock Block, Chicago, Ill., have put on the market the Volta electric lighting system, which aims to combine economy, convenience, simplicity and efficiency. There are no fuses, relays, rheostats, or dimmers, as everything is inherent in the generator itself. This generator is a bi-polar belt-driven machine of simple, rugged construction, and its chief feature is the integral automatic cutout which works at all speeds of the engine. It is mounted on the armature shaft and is contained in a dust-proof case. The Volta generator is made in two sizes, the larger of which



The Koban two-cylinder detachable motor which is now equipped with built-in magneto.



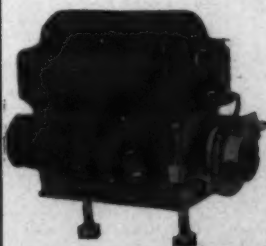
The latest Elite generator delivers 7½ volts at 8 amperes.



Thurber rotary air starter.



Inland piston ring.



Generator in the Volta lighting system.



The See + Phone.



Morris canvas-covered outboard motor boat.

New Gould Battery.

The Gould Storage Battery Co., 30 E. Forty-second St., New York City, manufacturers of storage batteries, are now marketing an improved battery for starting, lighting, and ignition. The grids of these batteries are of the well-known Gould type, designed to assure high conductivity and low internal resistance throughout the life of the plate. The active material in the positive plate is harder than ordinarily used, and in service wears evenly; the result being more uniform capacity throughout exceptionally long plate life. A large settling chamber at the bottom of each jar permits long service without cleaning. Short circuits between the plates are prevented by wide separation and rugged separators. Perhaps the most appreciated feature of these batteries is the neat cover arrangement intended to absolutely prevent leakage of electrolyte, permit easy, thorough internal inspection and admit of removal of plates if necessary. The jars are completely surrounded by a compound, which cushions vibration, etc. Each cell is virtually sealed by three hard rubber covers and labyrinth passages and a baffle splash plate.

Koban Built-In Magneto.

A built-in magneto is one of the new features of the 1915 Koban rowboat motor, manufactured by the Koban Mfg. Co., of 246 So. Water St., Milwaukee, Wis. Considerable thought was required in the preparation of this magneto, for while many standard types were available it required special construction to build a magneto that would answer the requirements of a two-cylinder motor and be an integral part of the engine. One of the features of the Koban magneto is its reversibility, making it unnecessary to stop and crank up the motor when it is desired to reverse the direction of the boat, a simple pressure of a button doing this automatically. The accompanying illustration shows the latest Koban model with the built-in magneto.

Kuhls' Elastic Spar.

H. B. Fred Kuhls, manufacturer of marine specialties at 65th St. and 3rd Ave., Brooklyn, N. Y., has put on the market Kuhls' Elastic Spar, a very pale, heavy-body, medium-drying varnish, which is very elastic and will not turn white, making it adaptable for marine purposes. One of the best known of Mr. Kuhls' previous specialties is his Elastic Seam Composition.

Thurber Rotary Starter.

The Northern Engineering Works, of Detroit, Mich., are bringing out a new model of the Thurber starter in improved form. In this, as in the older models, compressed air furnishes the operating power, and pump and starter are built together in a unit, although working independently. One valve controls both starter and pump. The pump is so designed that nothing but clean air can attain access to the starter. The cost for the standard model is \$85. This machine, in addition to starting the motor, can be used to store air in the whistle tank.

The See + Phone.

This device, which is patented by Thos. F. Hanlon, 1215 Filbert St., Philadelphia, Pa., is a combination of a form of "busbody" or reflecting mirror, such as graces a front window of many Philadelphia homes, with a megaphone. The device is shaped like an ordinary megaphone, but at its narrower end is fitted a hinged mirror which is tipped back out of place when one desires to talk through the cone. As a "busbody" it could be used to advantage aboard a boat by one who was sitting in the cabin and wanted to see (without being seen) who was coming aboard, or who was scraping the paint off the side of his boat with an oarlock.

Morris Canvas-Covered Outboard Motor Boat.

B. N. Morris, Inc., of Vezie, Me., is manufacturing a canvas-covered rowboat for use with outboard motors. The boat is 14 feet in length by a beam of 50 inches, and weighs 180 pounds. The depth at the bow is 22 inches, at amidships 18 inches, and at the stern 13 inches. It is of open gunwale construction, with extra heavy cedar ribs of good width, and spaced closely. The planking is ¾-inch cedar, covered with a special canvas and finished in a most painstaking manner. The rubbing strakes are of hard oak, and there is a brass bang plate. The boat has a keel and a 4-inch skeg; there are two bilge keels, three seats, bottom boards, and two pairs of oarlocks. Mr. Morris also specializes in motor canoes.

Motors Suitable for Restricted Class Racing.

A List of Motors Developing Their Powers at 800 R. P. M. and Over Suitable for Use in Restricted Class Boats.
An Arrangement in Order of Their Piston Displacement to Show the Logical Division of Classes.

(See article on pages 7, 8 and 9.)

Two-Cycle Motors.

Two-Cycle Motors.										Four-Cycle Motors.									
Cub. Inch	Rated H.P.	No. of Cyls.	Bere & Strake	Rated R.P.M.	Make	No. of Cyls.	Bere & Strake	Rated R.P.M.	Make	Cub. Inch	Rated H.P.	No. of Cyls.	Bere & Strake	Rated R.P.M.	Make	No. of Cyls.	Bere & Strake	Rated R.P.M.	Make
64	6	3	X	900	Morrison	4	X	1000	Wisconsin	286	40	4	X	1000	Winson	6	X	1200	Winson
64	6	3	X	900	Watkins	4	X	1000	Smallley	286	40	4	X	1000	Smallley	4	X	1000	Smallley
94	9	3	X	1000	Capitol	4	X	1000	Wisconsin	286	40	4	X	1000	Wisconsin	4	X	1000	Wisconsin
101	9	3	X	1000	Capitol	4	X	1000	Wisconsin	286	40	4	X	1000	Wisconsin	4	X	1000	Wisconsin
101	9	3	X	1000	Capitol	4	X	1000	Wisconsin	286	40	4	X	1000	Wisconsin	4	X	1000	Wisconsin
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Four-Cycle Motors.

74	Winton	6	3	4	1200
75	Sterling	4	3	4	1000
76	Windsor	4	3	4	900
77	Wisconsin	4	3	4	900
78	Wyandott	4	3	4	900
79	York	4	3	4	900
80	Morton	4	3	4	1000
81	Rich	4	3	4	1000
82	Rice	4	3	4	1200
83	Winton	6	3	4	1200
84	Niagara	4	3	4	900
85	Wis. Mach. & Mfg.	4	3	4	900
86	Waukegan	4	3	4	1200
87	Waukegan	4	3	4	1200
88	Waukegan	4	3	4	1200
89	Waukegan	4	3	4	1200
90	Waukegan	4	3	4	1200
91	Waukegan	4	3	4	1200
92	Waukegan	4	3	4	1200
93	Waukegan	4	3	4	1200
94	Waukegan	4	3	4	1200
95	Waukegan	4	3	4	1200
96	Waukegan	4	3	4	1200
97	Waukegan	4	3	4	1200
98	Waukegan	4	3	4	1200
99	Waukegan	4	3	4	1200
100	Waukegan	4	3	4	1200

Yard & Shop

Some Youthful Engineers.
The Gray Motor Co., of Detroit, Mich., are taking a good deal of justifiable pride in a letter received from a Gray owner, Mr. H. W. Randall, who lives at Grand Forks, N. D. This letter, which speaks for itself, runs as follows: "Am enclosing some pictures of our boat Chief, also a picture of the 'crew.' aged twelve, eleven and nine years. After a few minutes' instruction from the boat builders they have run the engine without the least trouble all summer. On July the fourth,

Getting a big fellow ready for the water at the yards of the Matthews Boat Company.

foister, spurred by two Maine captains, he goes on: "After carefully calculating the distance, I ran at full speed for a point directly across her bow. Then, when I was in line with her, the launch was turned, taking exactly

tention from the motor boating public. She is booked up like an opera star for the coming season's races, and, as she has already given an excellent account of herself, her owners are looking to garner another trunk load or so of silverware. This seaworthy speedster is 20 feet in length by 4 feet 9 inches beam, and she is powered with a Model F Red Wing Thorobred motor, developing a maximum of 30 h.p. She has made a speed of 23 knots.

Elite Dynamo Delivers 7½ Volts.
Owing to a typographical error in the advertisement of K. A. Gardner, of Rochester, N. Y., in our April issue, the power output of his Elite dynamo was given as only 1½ volts. That this was an incorrect figure is apparent on the face of it, but it is just as well to state here that this latest model Elite delivers 7½ volts at 1,800 r.p.m. This is done at an amperage of 8, or a total of 60 c.p., running direct.

New Van Blerck Dealers.
Mr. Bar W. Wadman, Sales Manager of the Van Blerck Motor Co., of Monroe, Mich., announces that a number of important agency contracts have recently been consummated by their Pacific Coast representative, Mr. W. J. Condon. Mr. Condon has been successful in making a contract with the G. M. Josephson Co., 54 Sacramento St., San Francisco, Cal., to act as distributors for Van Blerck engines in the territory surrounding San Francisco, and another good contract that he has been able to obtain is that with the Marine Engine & Supply Co., of Los Angeles, who will handle the Southern California territory. The territory surrounding Sacramento will be covered by Nunn Brothers, of that city. This firm was the owner and builder of Hoola B, the Van Blerck-powered boat that won so many races at the San Francisco regatta last year. Mr. W. H. Marvin, who has been identified with the well-known firm of Taylor & Young, of Vancouver, has severed his connection with that firm and will handle Van Blerck motors at his large display room in Seattle.

Reorganization of the U-S-L Co. Now Assured.
In the proceedings before Judge Hanzel, of the U. S. District Court of the Western District of New York, in Buffalo, March 30th, the receivers announced to the Court that a complete reorganization of the United States Light & Heating Company is now assured through the efforts of the stockholders' Com-



Chief, an 18-foot runabout, owned by H. W. Randall, of Grand Forks, N. D., "crewed" by his three children and powered with a single-cylinder Gray motor.

in the single-cylinder class, they beat four other boats, all smaller and with higher power. Chief is an eighteen-foot boat. We naturally are highly pleased with our little Model U Gray motor, for power and ease in operation." One of the photographs which Mr. Randall enclosed in his letter to the Gray company is reproduced in this section.

Byrne, Kingston & Co. Move.
Byrne, Kingston & Co., of Kokomo, Ind., advise us that they have changed the address of their Detroit branch. This branch moved into new and larger quarters on the fifteenth of April, and is now located at 870 Woodward Ave., where visitors are at all times welcome.

Cole Resigns from Ferro.
It has been announced that Mr. Roland Cole, formerly advertising manager of the Ferro Machine & Foundry Co., of Cleveland, O., handed in his resignation, to take effect on the 1st of April.

Wadman New Sales Manager for Van Blerck.
Bar W. Wadman, advertising manager for the Loew-Victor Engine Co., is now acting in the capacity of sales manager for the Van Blerck Motor Co., following up the co-operative sales plan of these two companies, but is continuing to handle the advertising and publicity work of the former company. Mr. Wadman has the entire sales and advertising campaign of the Van Blerck company under his charge.

Mr. A. G. Orison, who was formerly sales manager for the Van Blerck Motor Co., resigned from this position along toward the middle of March.

U. S. Navy Michigan Steel Boats.
The Michigan Steel Boat Co., of Detroit, Mich., announce that they recently furnished to the U. S. Government one of their 21-foot steel launches for use at the Panama Canal, and that they also furnished the U. S. Reclamation Service a 25-foot steel flyer launch for use at the new dam opened by the Government in New Mexico. Reports are that business around Austin, Tex., will be very flourishing this year, and the Michigan company has already shipped a large carload of boats to that point, consisting of a 35-foot runabout equipped with a 50 h.p. automobile engine, a 20-foot Blue Bird launch, a 25-foot runabout, a 21-foot compromise stern model, a 14-foot Blue Bird, and a complete assortment of marine accessories and parts for motor boats and marine engines.

Photographing a Dreadnaught from a Motor Boat.

We are indebted to the Panama Canal Works, of Tampon, Mass., for a bit of first-hand information of what it feels like to be nearly run down by a super-dreadnaught. They have sent us an interesting little story, by E. Muller, of the experience he had when he found forth with his camera in a 15-foot motor boat to snap the new battleship New York on her trial trip. Muller forbids the inclusion of his story in full—which is rather a pity. However, after describing how he obtained this 16-

the same course as the warship. When I had taken a position where the super-dreadnaught seemed to be coming directly at the lens of the camera, the launch was stopped and we bobbed about in the sea while the great floating fortress came plowing straight for us.

Mr. Muller has taken many pictures of battleships, but he was determined to make this one the best, so the engine was stopped because of its vibration, and he stood on the stern of his little craft to wait until the last moment at which escape would be possible. The ship plowed nearer and nearer, throwing out a bow wave of 50 yards on either side of her. Then—"I held my place on the bobbing stern until the on-rushing monster was only 75 feet away. Then I pressed the bulb, leaped back into the cockpit and yelled to the mechanic to start the engine. He cranked, but the engine refused to start!"

Well, after what seemed like an eternity, she started, and they cleared the bow by about three yards. Camera and crew were hurried to the bottom of the boat as they bobbed around in the foaming bow wave, but by some miracle the hull remained right side up and they made Rockland a little later, considerably unstrung. To Mr. Muller's surprise, he found when he reached his studio that the plate had been undamaged, although the camera was considerably the worse for wear. When he developed the plate he found that he had made the best battleship picture of his career.



Fleetwing, a 20-foot New Zealand boat of which great things are expected. She is powered with a Model F, Red Wing Thorobred, and already has a number of cups to her credit.



The completed plant of C. D. Durkee & Co., at Grassmere, N. J., where all sorts of marine accessories are manufactured.

mitted. It appears that the latter represent over \$2,000,000 of the \$3,500,000 outstanding preferred stock and about \$6,000,000 common stock, giving them the majority control. The application of the receivers was for the purpose of advising Judge Hanzel to wind up the receivership and transfer the company to the reorganized company.

Speed-Length Ratio.
In the article by Mr. Brown in the April number of Motor Boating it was stated that the speed-length ratio is the speed of the boat divided by the length. This is obviously an error, as this ratio is the speed divided by the square root of the length. The printer evidently was not technical enough to know what a square root sign meant, as he failed to follow the copy sent to him.

Charles E. Miller's New Catalogue.
Charles E. Miller, the well-known New York jobber, whose organization extends to practically all the large cities, is putting out his catalogue for 1915. Those who know Miller's previous efforts in the catalogue line will be expecting something pretty good in this issue, nor will they be disappointed. In the 115 closely printed pages will be found listed practically everything needed by motor boatman or automobilist, from tire pumps to portable garages on the one hand, and from gramophones to motors on the other.

Engine & Boat Manufacturers' Association Elects Officers.
At the recent meeting of the Executive Committee of the National Association of Engine & Boat Manufacturers, Inc., the following officers were elected for the ensuing year: President, John J. Amory; first vice-president, Henry B. Sutphen; second vice-president, F. C. Jones; third vice-president, C. A. Cright, and treasurer, James Craig. Mr. Walter L. Fay was elected to the Executive Committee to serve out the unexpired term of one of the retiring members.

Boat San Francisco Branch Moves.
The Bosch Magneto Company's San Francisco branch, which

is under the management of R. H. Miller, and which for a number of years has been situated at the lower end of Van Ness Ave., has been moved to the upper end of the boulevard and is now located in the corner of the new motor boat section. This branch has grown too large for its original quarters, due to the increasing business in that section. The new location will provide almost double the room in the service department, and the stock room

furnishes the motive power for moving an 18 x 5-foot houseboat for long distances down the river. Last summer Mr. Cooper and four of his cronies set off on a 165-mile jaunt from the home town to Merrill, Minn., the little Sweet taking the houseboat and another skiff in tow and doing the distance in four days, traveling 6 to 8 hours a day. Arrived at their destination, the five men hunted and fished for about ten days, going to the hunting grounds in their outboard-motor-propelled rowboat, and finding

with constructing new craft, overhauling and rebuilding old ones, and selling others. The 10-footer Antares, built by this concern some years ago, has been completely altered for her new owner, Mr. John Tyson, of Greenwich, Conn. The boat has been in active commission all winter. A 40-foot cruiser of which we are sure to hear more in a few weeks is well under construction for a New York yachtsman. This boat will probably be entered in the New York-Savannah Race, and also in the race to Bermuda, in the event of one being held this season. A fast 30-foot hydroplane is also under construction, and the 60-footer Abalone, owned by Arnold Schiess, is undergoing extensive alterations.

Pioneer Boat & Pattern Company Reorganized.

O. A. Marsac and A. L. Arnold have purchased the machinery, personal property and good will of the Pioneer Boat & Pattern Company, of Bay City, Mich., and will continue the business, for the present at least, at the location occupied by that company. Mr. Arnold is a boat designer of wide reputation, motor boats and sail craft designed by him being found all over the United States; he has been with the old company for the past seven years, and now, being part owner, will give his personal supervision to all orders received. Mr. Marsac has also been connected with the old company for a number of years in a business capacity, and has a wide knowledge of the business end of boat building.

President Mesasol, of Cuba, Buys Lamb.

The 60 h.p. heavy-duty Lamb engine which, among others, the Lamb Engine Co., of Clinton, Ia., had on exhibit at the Chicago Show, has been shipped to Cuba to be installed in President Mesasol's 83-foot yacht Marianna. This 1915 model is to replace his older model Lamb engine, and it will make his boat one of the most complete in Cuban waters.

Carnas & Bowses Stock Hydroplanes.

Carnas & Bowses, Bourse Building, Philadelphia, Pa., sales representatives of the Standard, Van Blerck, Low-Vigor, Ferro, Bridgeport and Universal motors in Pennsylvania, New Jersey and Delaware, announce a new stock boat proposition, which is considered remarkable from the fact that much is given for a small amount of money. The little craft, which will be known as the Carlo Flyer, has been developed along a well-thought plan—that is, a large number being built in what may be called a Fordized proposition. This hydroplane, which was designed by Bowses & Mower and built by the Mathis Yacht Building Co., is 14 feet 3 inches overall by 4 feet 4 inches beam. She is cedar planked, copper fastened and mahogany trimmed, and is powered with a four-cylinder



Josephine is a 44-foot cruiser, owned by Mr. Carl Reichel, of Erie, Pa. Equipped with a 20-34 h.p. Buffalo, she maintains a speed of 9 1/2 miles.

and offices are also of greater size. With the ample room in the new branch, customers who bring their cars for the purpose of having a Bosch installation made will receive prompt service.

O. V. B., a Doyle 25-Footer.

The little cruiser shown in the accompanying photograph is O. V. B., built by the American Launch Co., of Bayonne, N. J., for Benj. Schneider, of New York City. She is of the Doyle V-Bottom type, with curved sides, and is 26 feet in length by 8 feet 4 inches beam. Owing to the wide beam, she is an extremely roomy boat and possesses cabin and cockpit accommodations equal to those of a much larger cruiser. The engine is a 3-cylinder 2-cycle 15 h.p. Ferro motor, and is installed under a box hatch in the cockpit, with the flywheel projecting into the cabin. The cockpit is above the waterline and is self-bailing and the occupants can obtain a clear view in all directions. This boat is being turned out by the American Launch Co. as a regular stock model in all stages of construction.

Bradford Burnham with Sterling Co.

R. Bradford Burnham, formerly of the advertising department of Doubleday, Page & Company, and more recently with the Frank A. Munsey Company, has accepted a position as advertising manager of the Sterling Engine Company, of Buffalo, N. Y. Mr. Burnham has for a long time been interested in the marine motor industry, and his feature articles



A 15-knot boat which has been making a name for herself on the other side of the globe. She is owned by Mr. Harry Kasper, of Auckland, N. Z., and is equipped with a 20-35 h.p. Sterling.



D. V. B. is a Doyle V-bottom, 25-footer, of a stock model turned out by the American Launch Company. This roomy craft which is described elsewhere in this section, is powered with a Ferro motor. She is owned by Mr. Benj. Schneider, of New York.

in this magazine and others on the subject of motor boat cruising have made him well known among the motor boat enthusiasts of this country. His many friends wish him all success in his new connection.

Texas Buffalo Agency.

The Buffalo Gasoline Motor Co., of Buffalo, N. Y., announce the appointment of the Walter Tins Co. as their sales representatives in Austin, Tex., and vicinity. This concern will be in a position to furnish all motor boat owners in that region with full information in regard to Buffalo engines and to supply them with repair parts.

Valley Boat Co. Purchases Valley Boat & Engine Co.

The Valley Boat Co., of Saginaw, Mich., announces the purchase of the entire plant and business of the Valley Boat & Engine Co. The business will be managed by Newell Barnard, who was president of the old company. The Valley Boat Co. are fortunate in being able to secure this thoroughly organized and equipped plant for the production of Valley boats, and they consider their prospects for the coming season very bright indeed.

Josephine.

One of the photographs on this page shows Josephine, owned by Carl K. Reichel, of Erie, Pa. She is 44 feet 5 inches in overall length, with a beam of 11 feet 5 inches, and she draws a trifle over 2 feet. Her power plant is a 20-34 h.p. heavy-duty Buffalo, which gives her a speed of 9 1/2 m.p.h. Josephine made her maiden trip to Fort Dover, Ont., recently, maintaining her regular cruising speed of 9 1/2 miles all the way. Mr. Reichel intends to use her for extensive cruising on the Great Lakes this summer.

Maudie II, an Auckland Winner.

An illustration in this department shows Maudie II, a Sterling-powered cruiser which took part in the recent Anniversary Regatta at Auckland, N. Z. In the race for cruisers of over 10 knots, Maudie II, with a 20-35 h.p. Sterling in her, drove home to first place, although she was smaller in both hull and power than her closest competitor. In the speed class event this boat was accorded second place. The owner of the craft is Mr. Harry Kasper, of Auckland, and the designers are Valley & Lowe, of the same city. The boat is 26 feet in length by 8 feet 6 inches greatest beam, and she has a speed of 15 m.p.h. She is equipped with a Hyde three-bladed 18 x 24-inch propeller, which she turns over at 1,100 r.p.m.

The Versatile Sweet Motor.

The Sweet Mfg. Co., Detroit, Mich., have a satisfied customer in Mr. W. M. Cooper, of Hattiesburg, Miss., who is the owner of a 4 h.p. Sweet detachable rowboat motor. This machine not only drives the skiff Hattiesburg (K-10-U-8) at a speed which outpaces the other boats in his neighborhood, but

the skiff, but up to the time the houseboat was abandoned the Sweet had made 225 miles of heavy tow without missing a beat.

Spring Activities at Luders' Yards.

In spite of war conditions, the yacht yards of the Luders Marine Construction Co., of Stamford, Conn., are being kept pretty busy this spring, what



W. M. Cooper, of Hattiesburg, Miss., and his cronies on their 10-foot houseboat. This craft was successfully towed for 225 miles by a Sweet detachable motor.

Saint Louis V-Bottom Runabout.

The plans on this page show a new 26-foot V-bottom runabout now produced by the Saint Louis Yacht & Boat Co., of St. Louis, Mo., which has proven particularly popular. All the strength members of this boat are selected, well-seasoned white oak, the planking is of cypress or white cedar, depending on the weight and speed desired, and the trim is of solid Honduras mahogany. The standard engine equipment is the new 3 1/2 x 5 1/2-inch 4-cylinder Sterling engine with either rear starter or electric starter, which gives the boat a speed of 20 miles per hour.

Evered's Patent Stamps.

The Evered Motor Co., of Milwaukee, Wis., have recently got out a set of poster stamps which they are distributing. These stamps, which are very attractive in design and execution, show the popular pastime of wintering in all countries of Europe, Asia and America.

Black Duck, a 17-Miller.

One of the photographs shown on this page is of Black Duck, a high-speed 19 1/4 x 8-foot cruiser designed by J. Murray Watts for Mr. Alexander Sellers of the Corinthian Yacht Club, and built by the Mithila Yacht Building Co., of Camden, N. J. Although the winner did not expect to win many races on the time allowance basis, nevertheless she won the first race in which she was entered at Cape May, carrying off the fast time prize and winning the time allowance prize from scratch. The boat is of very heavy construction, having 1-inch oak frames, 1 1/4-inch planking and teak joiner work. Two 6-cylinder 5 x 6-inch Van Blerck motors are installed, developing about 25 h.p. each at 600 r.p.m., and a speed of 17 miles per hour is obtained.

Marblehead Anti-Fouling Green.

One of the best known anti-fouling compositions on the market is Marblehead Anti-Fouling Green, manufactured by the Stewart-McKay Mfg. Co., of Marblehead, Mass. This paint has won a high place for itself among yachtsmen because of its effectiveness in keeping the bottom of yachts free from growth and barnacles during an entire season. Another interesting point in regard to this paint is its hard and slippery finish, and it is stated that boat bottoms can be painted year after year



A typical Hand V-bottom cruiser, built and owned by A. E. Raymond & Co., of Ft. Myers, Fla. This 30-footer is driven 18 1/2 miles per hour by a 40 h.p. Leece-Victor motor.

without the necessity of repriming. No priming coat is used when it is applied to wood, but when used on metal the makers advise a priming coat of red lead. As Marblehead Green is not a copper paint, it is claimed to be a very successful composition for use on steel vessels.

No Calamity Howling from Kermath.

The Kermath Mfg. Co., of Detroit, Mich., find that business is coming in very steadily from practically all parts of the country, and, taking their early orders as an indication of the way the wind blows, are figuring on a very dependable season—season which, while it may not show any increase over last year's sales, will at least hold up to them. From Southern California, especially, come reports of numerous Kermath sales. The Marine Engine & Supply Co., of Los Angeles, announces recent sales as follows: Motor to W. G. Pfaffenberger for use at Anaheim Landing, Cal.; one to F. L. Martz, of Los Angeles; one to L. T. Shettler for use in the harbor at Los Angeles installed in a 34 x 8-foot cabin cruiser; one to Jas. W. Marsh, another to Fred A. Walton, and one for the Lacy Mfg. Co., all of Los Angeles. Among the notable sales is a motor to A. G. Sepulveda, San Pedro, for installation in a 42 x 11 1/2-foot yawl as an auxiliary. The 12 h.p. motor with a heavy flywheel is stated to be driving this big boat at about 6 miles an hour and to be doing it at 24-hour stretches.

Two More Anderson Florida Agents.

The Anderson Engine Co., of Chicago, Ill., have just added to their list of wide-awake southern agents the names of J. T. Hamilton, of Palm Beach, and G. T. Backus, of Fort Pierce, Fla.

Waterman Orders W. & M. Propellers.

The Waterman Motor Co., of Detroit, Mich., have recently placed an order with the Wilmarth & Norman Co., of Grand Rapids, Mich., for 1,000 reversible propellers for use with their Porto outboard motors. "According to the propeller manufacturers, their product was selected because it gives still greater flexibility to these motors when it is desired to use them for trailing purposes. The W. & M. reversible propeller is stated to be fully as strong as a solid wheel, and to have combined with this strength the qualities of a speed wheel, so that it possesses advantages which make it a valuable accessory for any outboard motor. The Wilmarth & Norman Co. state that before the end of the season various other well-known outboard motors may be purchased equipped with their product."

Fay & Sorensen to Italy.

The Fay & Sorensen Engine Co., of Geneva, N. Y., have just completed and shipped to Leghorn a number of their engines for use in Italy. They state that this order is the

direct outcome of the thorough satisfaction given by a number of their engines shipped to that country some little time ago.

Federal Factory Busy.

It is announced that the new Federal rowboat and canoe motors of the Federal Motor & Mfg. Co., of Washington, D. C., are being shipped daily from their Newark factory. The plant is now

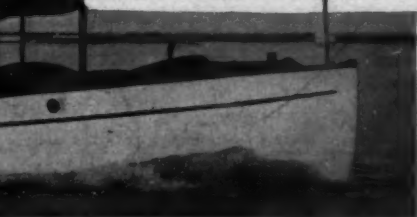


Black Duck, 30 feet 6 inches in length and of heavy construction, makes 17 miles per hour, powered with two 25 h.p. Van Blerck motors. Her owner is Mr. Alexander Sellers, of Philadelphia.

working overtime to meet the demand, but shipments are being made promptly, and assurance is given that orders for any number of motors can be filled. The makers also state that while agency contracts for the handling of the Federal in the United States and foreign countries are being rapidly closed, some desirable territory may yet be had.

Senator Harding's New 35-Footer.

One of the first boats of the season to be launched is



the new 35-foot Ramaley Perfection runabout, delivered to Senator D. F. Harding, Jr., of Chicago, by the Ramaley Boat Co., of Wayzata, Minn. This sale was the direct result of the visit made by Senator Harding to the Chicago Motor Boat Show. The Senator will use this splendid boat on Lake Minnesota. The boat is 35 x 6 feet and is an exact duplicate of the 35-footer exhibited by the Ramaley Company at the show. The power plant of this new boat is one of the 1915 Model E-6 Van Blerck, equipped with a two-unit Leece-Neville electric starter.



Bird's-eye view of the 17-acre plant of the Mason Machine Works, Taunton, Mass. In this plant, under the direction of Albert E. Eldridge, the manufacture of Jager marine motors, will be carried on on a larger scale than ever before.

On her first run the boat made well over 35 miles per hour, and better than this is expected.

The Boech Magneto Company, of New York, advise us that they have received news from their San Francisco branch to the effect that the championship of San Francisco, which was raced for under the new rules of the A. P. B. A. recently, has resulted in a clean sweep for Boech magnetos. The first boat to cross the line was Bonnie Don, and those to follow her came in in the following order: Kicheoquillas,

Scott, Eulalie and Lencora. All of these five boats depended on Boech magnetos for ignition, and the winner also used Boech plugs.

The Home of Cleveland's Marine Supply House.

One of the pictures in this section shows the imposing home of the Motor Boat & Supply Co., of Cleveland, O., at 1467-11

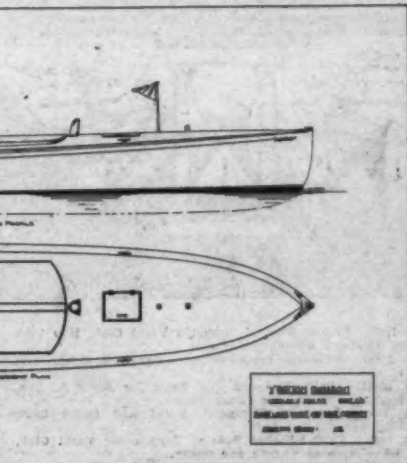
W. 9th St. These people have been in the marine field for over twenty years and are well known both for the specialities they themselves manufacture and for the amount of business they handle. Their already large quarters are stated to be hardly ample enough for the needs of their business. The concern is issuing a very handsome 150-page catalogue which they will send on receipt of five cents to pay postal charges. They handle the best lines of marine goods and state that they take special pride in making prompt shipments.

The Push Button Control of the Calles 3-Speed Motor.

One of the most interesting of the many improvements which have been added to the Calles portable motor, manufactured by the Calles Perfection Motor Co., of Detroit, Mich., is the push-button five-speed control. The Calles has five distinct speeds—two forward, two reverse and neutral—and these changes are accomplished by shifting the steering handle, which in turn changes the position of the propeller blades, the propeller being of the reversible type. The illustration of this device on the next page shows how slightly the handle must be moved to accomplish these speed changes. A paramount advantage of the Calles five-speed control is in the operator's being able to start the motor with the propeller blades set in neutral before untying from the wharf. It is also unnecessary to stop and reverse the motor when backing, as the movement of the control handle reverses the propeller blades instantaneously.

Kermath Agent in P. Q.

It has been recently announced that the Rhos Sales Co., of Montreal, have taken the distribution of Kermath products in the Province of Quebec for the 1915 season, and will carry a complete stock of engines and parts at Montreal for the purpose of giving service to Kermath owners. Both lines of Kermath motors will be carried for immediate delivery in the various cities made by the company. Mr. Rhos is looking forward to a very successful Kermath business in his territory as there is a great demand for this class of engine at that point, and at the present time there are a large number of Kermath engines in use in various parts of Quebec, all reported as giving excellent satisfaction.



Outboard profile and arrangement plan of the 26-foot stock V-bottom runabout, made by the Saint Louis Yacht & Boat Company, and mentioned on this page.

The Waterman Motor Co., in order to take care of the increasing marine motor business, as well as the business which the lighting outfit is creating, has doubled its capitalization, and is looking forward to the largest year in its history.

Noted Sportsman Now Steering Owner.

The Sterling Engine Co., of Buffalo, N. Y., announce that one of their 6-cylinder 50-60 h.p. entirely enclosed special cruiser engines has been ordered by Mr. George Ketchum, the well-known Toledo sportsman, to turn the power plant of his new yacht, which the Matthews Boat Co., of Port Clinton, O., are now building. The boat is to be a handsome bridge-deck cruiser, 35 feet by 13, and will be christened Cresson in honor of the owner's once famous race horse.

Pierol of Boston Reports Sales.

W. Burton Pierol, who opened office at 10 Post Office Square, Boston, Mass., last October, to handle Scripps motors exclusively, writes that the "depression" in the New England States of which so much is heard is more imaginary than real. As proof he points to the following orders recently closed by him: Mr. E. W. Reed, member of the Boston Yacht Club, has under construction a 33 1/4-foot runabout from designs by E. N. Burwell of Tufts College. For his power plant Mr. Reed has chosen a 4-cylinder Model K Scripps equipped with an electric starter. Mr. W. H. Eaton, of Waltham, Mass., has also become a member of the Scripps family, purchasing one of the new enclosed type Series B 4-cylinder Scripps, which he will install in a new 30-foot Deed runabout. Mr. E. M. Churchill, of Boston, has chosen a 3-cylinder 5 1/2-inch Transatlantic Model L to power his Hand V-bottom cruiser which he will use along the North Shore and Maine coast.

Trade Literature Received.

We are in receipt of a four-page folder from the New York office at 30 Church St., of the Bellows Co., of Stockholm, Sweden, of a four-page folder describing the Bellows direct reversible marine oil engine. The idea in getting out this folder is to be able to hand to interested parties a sheet that will, in concrete form, show very clearly what this company is building and how it is operated, without the necessity of reading through many pages.

The Wolverine Motor Co., of Bridgeport, Conn., have sent us a folder descriptive of their six-cylinder 175 h.p. producer gas, 200 h.p. oil engine. This folder gives the



A Gardner grinder at work in the Carlys Johnson Machine Co.'s Manchester, Conn., plant, surfacing cases for the Johnson marine reverse gear.

complete specifications of the motor, and also shows cuts illustrating both sides of the machine. One page is devoted to a description of the Wolverine 5 h.p. "Special" auxiliary outfit.

The Low-Victor Engine Co., of Chicago, Ill., have just published what might be termed a Panama-Pacific catalogue, for the cover is a reproduction of one of the beautiful buildings at the San Francisco Exposition, and on the fly leaf is printed a cordial invitation for all visitors at the Big Fair to call on the Low-Victor display of engines. The catalogue deals with the various models of the Low-Victor line, and the information is given in handy form.

The 1915 edition of the catalogue issued each year by the W. H. Mullins Co., of Salem, O., has found its way to this office, and both as to appearance and subject matter it beats all its predecessors. The Mullins line of steel boats is constantly being improved, and the same can be said of the catalogue, thus providing a combination which is hard to beat.



The Standard Co., of Torrington, Conn., send us their new catalogue which contains complete descriptions of their line of Eagle 2-cycle engines. There are something like twenty motors in this line, and their specifications make pretty interesting reading, especially at this time of the year.

The E. J. Willis Co., of 85 Chambers St., New York City, have issued their 1915 catalogue B of marine supplies. The catalogue contains 71 pages and every page is profusely illustrated with barometers, reverse gears, lighting outfits, propellers, magnets, ship hardware and other things too numerous to mention. One of the leaders of the Willis line is the Wilco outboard motor.

The Sterling Motor Co., of Detroit, Mich., have just gotten out a very handy circular dealing with their Model H-B cruiser and runabout engine. Full specifications and a number of illustrations are given, and the circular is very tastefully designed and printed.

The 1915 catalogue of the Brooks Mfg. Co., of Saginaw, Mich., which has been forwarded to this office, contains additions to their line of K. D. boats of various types, and many interesting photographs of Brooks boats built by their customers.

The Ferro Machine & Foundry Co., of Cleveland, O., are organizing a strong dealers' campaign, and have issued two

notable folders setting forth the advantages of the Ferro outboard motor, from both the dealer's and the owner's standpoint.

The Stringer Portable Motor Drive and its advantages are pleasingly portrayed in a descriptive folder recently issued by the Stringer Marine Engine Co., of Detroit, Mich.

The Carlys Johnson Machine Co., of Manchester, Conn., have sent us a copy of their 1915 catalogue wherein the two models of the two-cycle Bud-E marine motor are set forth. These motors are furnished as unit power plants and make very complete outfits for the canoe or motor tender.

The Radio Boat Co., of Racine, Wis., and New York City, have favored us with a copy of their latest catalogue. This booklet is full of information regarding the various stock models and marine accessories turned out by this company.

The W. H. Mullins Co., of Salem, O., have just brought out their 1915 catalogue of Mullins cedar canoes. These are furnished in various types and lengths, with and without spars.

George Lawley & Sons, Inc., of Neponset, Mass., have sent us quite a sheet of catalogue descriptive of their various activities in marine construction. Lawley tenders, runabouts, motor lifeboats, sailboats and motor yachts are mentioned, and illustrations which show up the beauty of their lines are included.

The marine department of the Pope Motor Car Company, New York City, have sent us a folder describing a 24-foot Hand V-bottom boat which they are marketing. This boat is constructed of the finest material, is equipped with a Low-Victor motor, and has a guaranteed speed of 20 miles per hour.

From the Sterling Engine Co., of Buffalo, New York, comes in folder form the announcement of one of their latest efforts—a six-cylinder motor for boats 50 to 75 feet in length. Special care has been devoted to make this machine de luxe in every respect.

The Bantam Anti-Friction Co., of Bantam, Conn., have just issued their "official blue book," which, printed in facsimile of blueprints, gives data and specifications concerning all their ball and roller bearings.

We have received from the Wilmarth & Norman Co., of Grand Rapids, Mich., a catalogue of their reversing propellers. This booklet, in addition to listing and pricing the various types of reversing propellers got out by this concern, gives also valuable information for any one who is in the market for a propeller.

"Winners of 1914," published by Edward Smith & Co., the varnish makers of Chicago, Ill., has made its appearance, and is fully as interesting as any of its predecessors. In this book of 128 pages are given, alphabetically arranged by clubs, all the winning boats of the past season.

The Calles Perfection Motor Co., of Detroit, Mich., have forwarded a copy of their new catalogue descriptive of the Calles Five-Speed outboard motor.

Dirige compasses and the recently introduced Delineograph are interestingly told about in a catalogue which has just been published by Eugene H. Stearns, of Bellevue, Wash.

The Sterling Engine Company, of Buffalo, N. Y., have just sent us a folder which combines a summary of the complete Sterling line with a handy speed table.

Morris Canoes are described and illustrated in an interesting catalogue sent us recently by E. M. Morris, of Yonkers, N. Y. Mr. Morris has also published a leaflet descriptive of his outboard motor rowboat which is described on another page of this magazine.

Detailed specifications and the whole story of the manufacture and of the material that goes into the manufacture of Niagara engines are given in an interesting catalogue recently issued by the Niagara

Motors & Manufacturing Co., Inc., of Dunkirk, N. Y.

We are in receipt from the Defoe Boat & Motor Works, of Bay City, Mich., of their catalogue No. 13, descriptive of their line of 1915 motor boats.

William H. Head, Jr., of New Bedford, Mass., has sent us a copy of his 1915 catalogue of Hand V-bottom motor boat designs. This booklet is well illustrated with plans and hull-tones, and some of the better known of the boats which are pictured are Ginger, Skiffingale, Old Glory II, and the Pinta family.

The Gray Motor Co., of Detroit, Mich., have just published a new marine catalogue, showing a complete line of two and

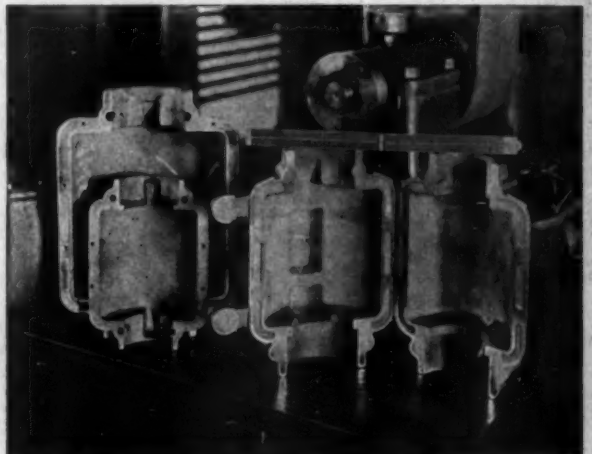


Home of the Motor Boat & Supply Company at Cleveland, and their floating supply station.

four-cycle motors. The catalogue is very carefully arranged, and in it will be found some of the new Gray two-cycle features, such as the built-in reverse gear, the bronze pump, pump, cylinder controls, unit power plant, magneto equipment, etc. The "Boat Builders' Catalogue," published also by this concern, and the "Book of Boats" show the specialties of the leading boat builders throughout the country.

A new profit-sharing plan inaugurated by the Motor Boat & Supply Co., of Cleveland, O., whereby by making a deposit with this concern at the beginning of the season, the boat owner who needs anything in the accessory line can take advantage of a ten per cent. discount, is interestingly told about in a folder issued by this company.

The Gas Engine & Power Co. and Charles L. Seabury & Co., of Morris Heights, N. Y., have sent us two catalogues descriptive of Speedway products. One shows some of the famous yachts built by this concern, describes their stock boats, and devotes some space to their generating sets, alcohol stores, etc., and the other is an owner's instruction book for the Speedway marine engine.



The use of the Gardner grinder by the Carlys Johnson Company resulted in their putting out a more finished and more compact oil-tight cover for their reverse gear.

CALENDAR

1915 May 1915

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27	28	29	30			

June 6th. Open Races at Columbia Yacht Club, New York City.
June 16th. Handicap Cruiser Championship of the Delaware River. (Sanctioned by A.P.S.A.)
June 19th. Annual Long Distance Race of New York Motor Boat Club, New York to Albany and return, 270 miles.
June 26th. Annual Ocean Race of N. Y. Athletic Club, New Rochelle to Block Island, 100 miles.
July 10th. Annual Race of Colonial Yacht Club, New York to Caribbea Lightship and return, 100 nautical miles.

July 17th. Cruiser Race at Columbia Yacht Club, New York to Stratford Shoal and return.
July 24th. Handicap Cruiser Race, Baltimore to Camden, N. J.
July 25-31. Gold Challenge Cup Races for A.P.S.A. Cup, Massachusetts Bay, Long Island Sound.
Aug. 7th. Race at Bucktown Yacht and Canoe Club, Camden, N. Y.
Aug. 14th. Long Distance Race of Tappan Zoo Yacht Club, Grand View to Hudson and return.

Aug. 29th. Handicap Glass Cabin Cruiser Championship of the Delaware River.
Aug. 29th. Handicap Open Boat Championship of the Delaware River.
Sept. 6th. Annual Regatta of the Hudson River Yacht Racing Association, Poughkeepsie, N. Y.
Oct. 9th. Handicap Displacement Race Championship and Handicap Hydroplane Championship of the Delaware River. (Sanctioned by the A.P.S.A.)

MOTOR BOATING ADVERTISING INDEX

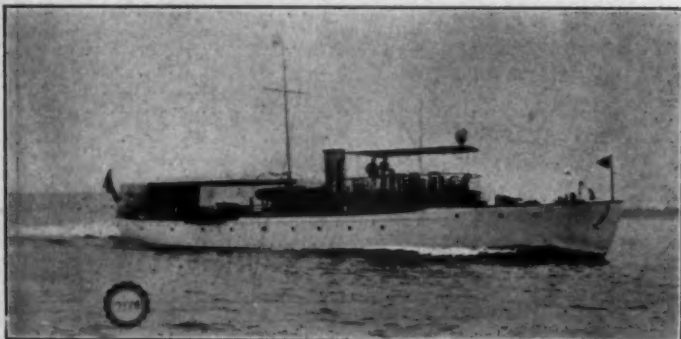
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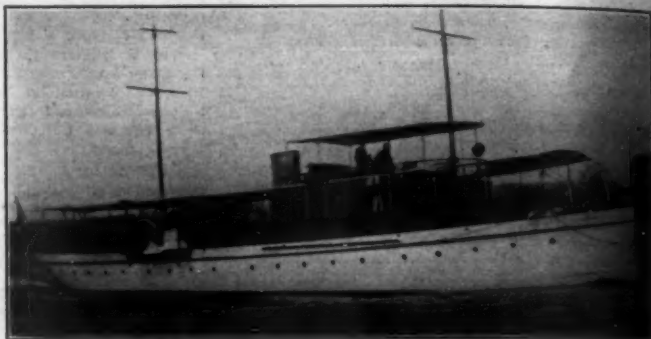
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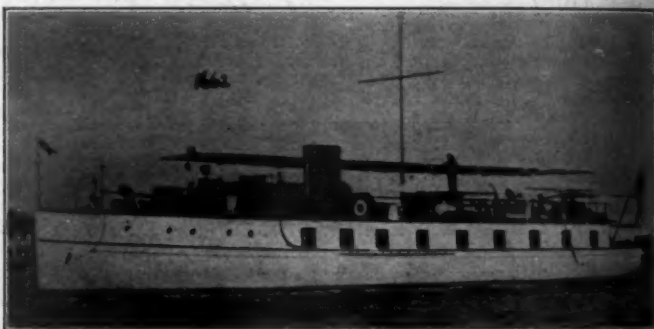
No. 1798.—For Sale or Charter.—Exceptionally fast, twin screw cruising power yacht; 105 x 15.5 x 4.9 ft. Speed up to 20 miles. Large dining saloon, three staterooms, two bathrooms, etc. Very able craft. Cox & Stevens, 15 William St., New York.



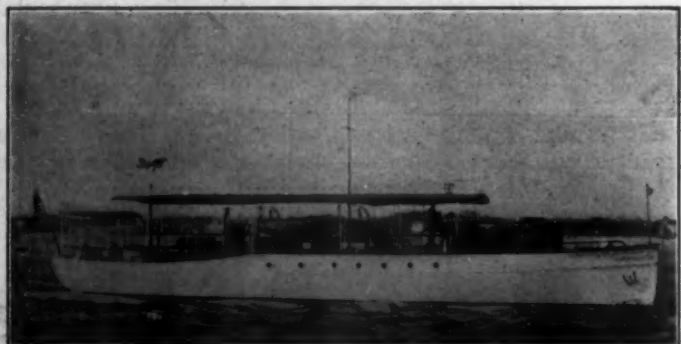
No. 1796.—For Sale or Charter.—Very roomy, twin-screw cruising power yacht; 99 x 17 x 4 ft. Recent build. Speed 13-15 miles; Standard motors. Large dining saloon, six staterooms, three bathrooms; all conveniences. Cox & Stevens, 15 William Street, New York.



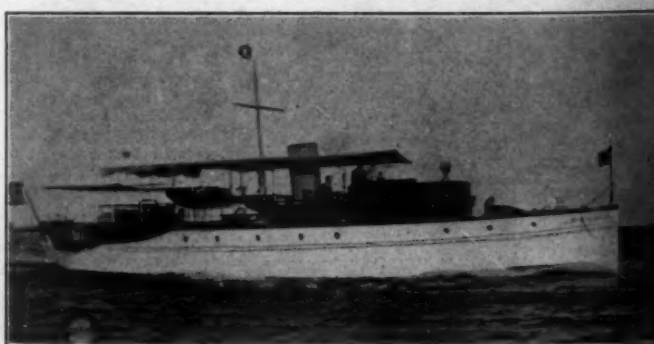
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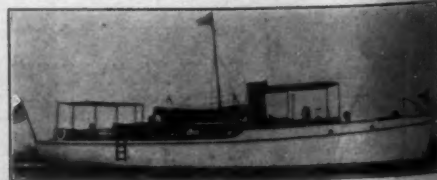
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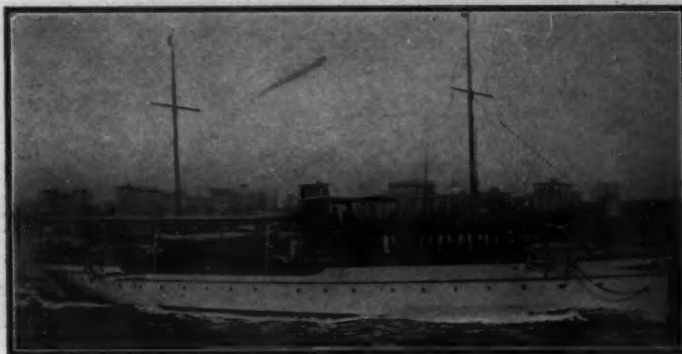
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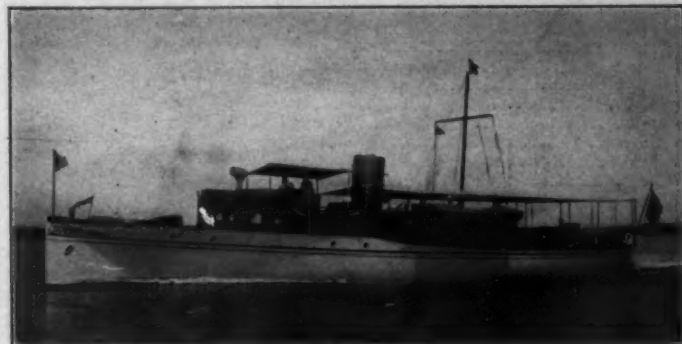
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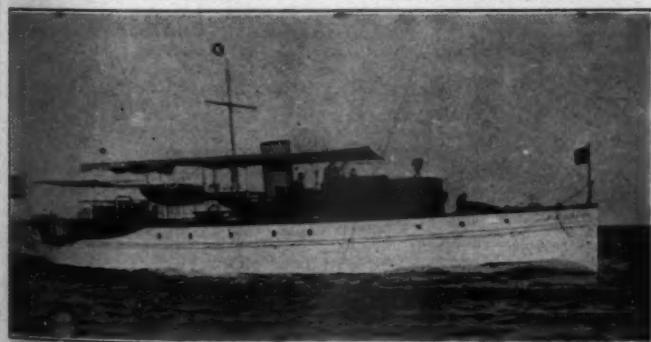
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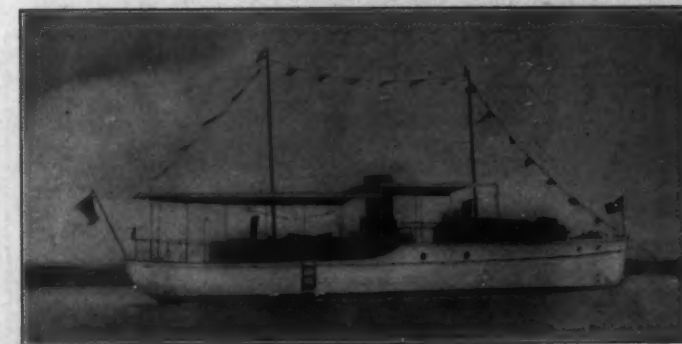
7086.—Here is an opportunity to procure at a big bargain an exceptionally fine 94 ft. Herreshoff Steam Yacht 17 1/4 ft. beam, 4.10 draft; 6 staterooms. Bath; speed 10 1/2 knots. All conveniences; operated more economically than gasoline boat same size. First class condition throughout. Stanley M. Seaman, 220 Broadway, New York.



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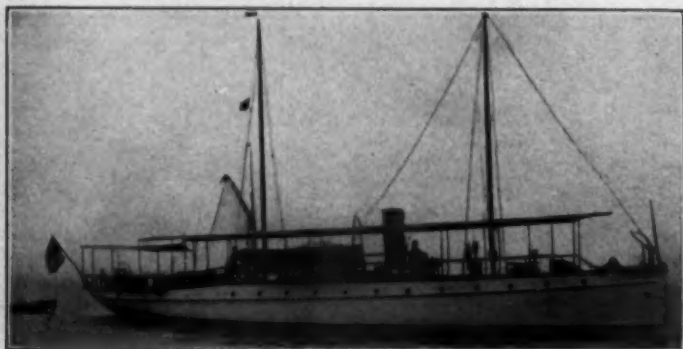
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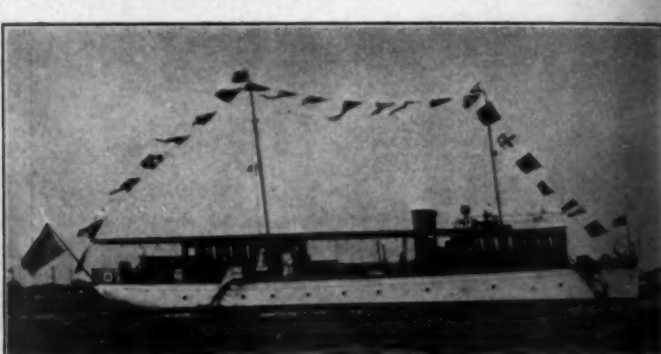
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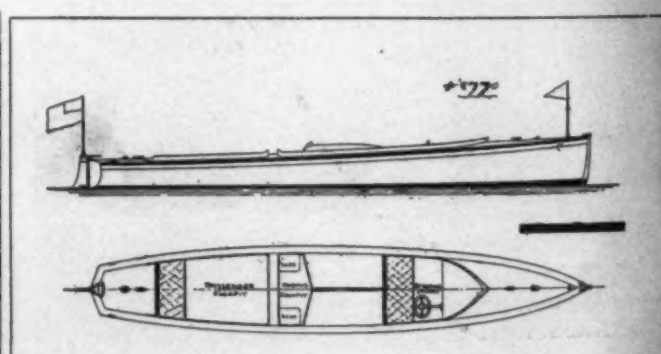
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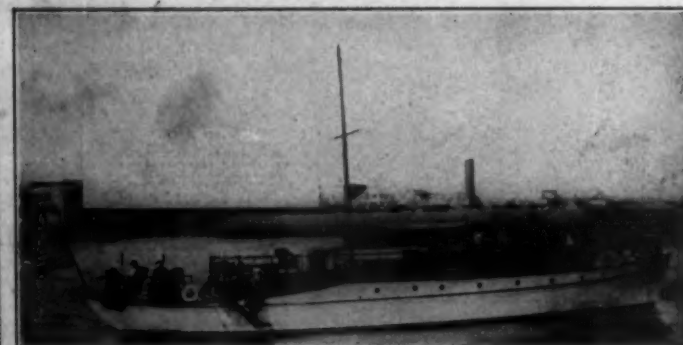
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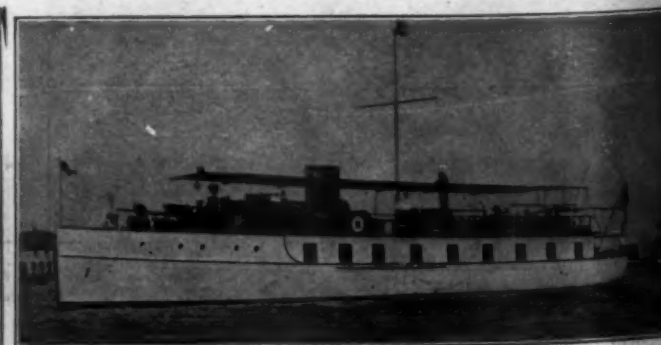
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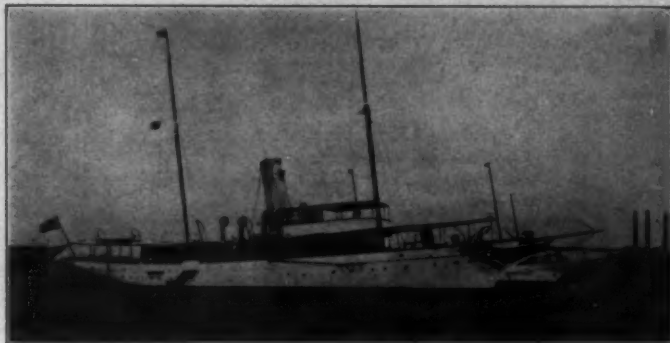
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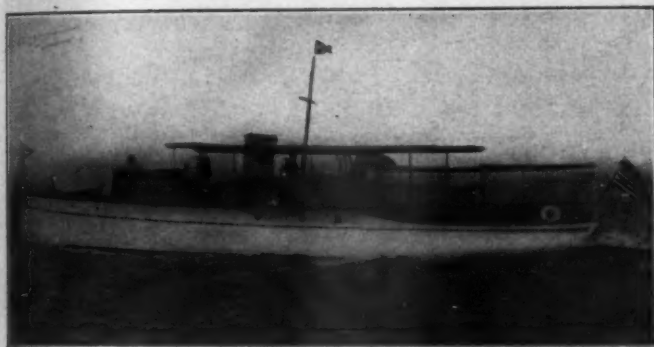
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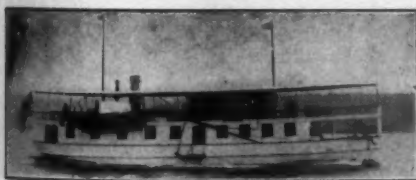
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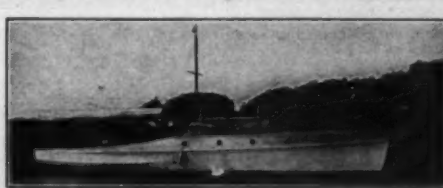
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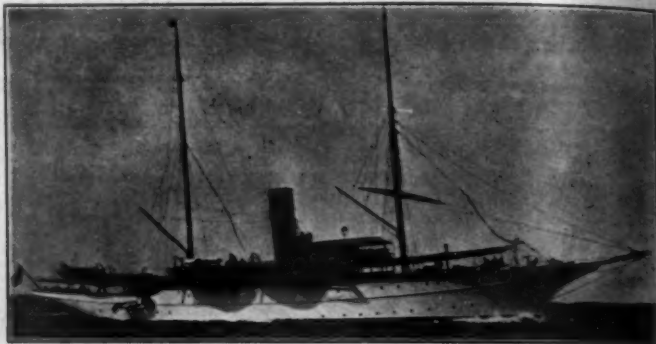
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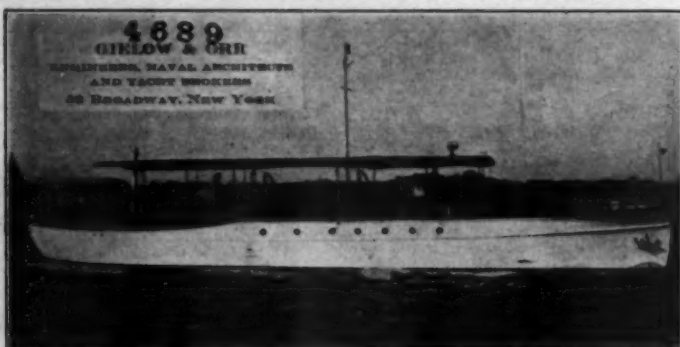
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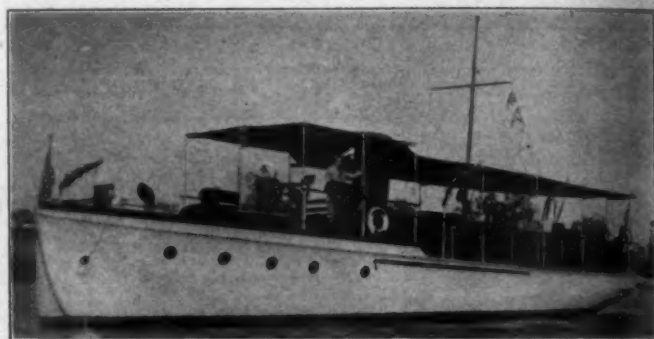
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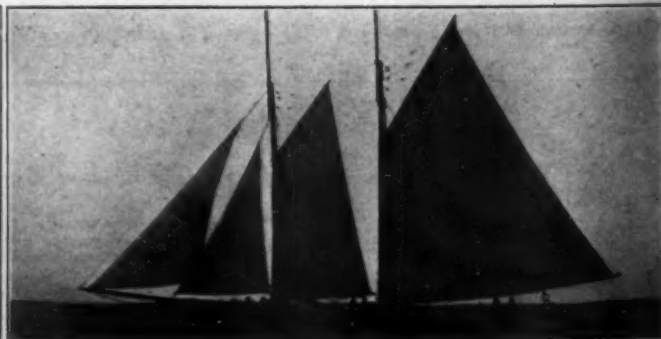
No. 4689.—For Charter.—Twin screw cruising motor yacht, 78 x 16 ft. 6 in. x 3 ft. 6 in. draft. 2 double, 1 single stateroom. Bath room and toilet. Dining saloon. Main saloon and deck house. Electric lights. Hot water heating plant. Reasonable price.



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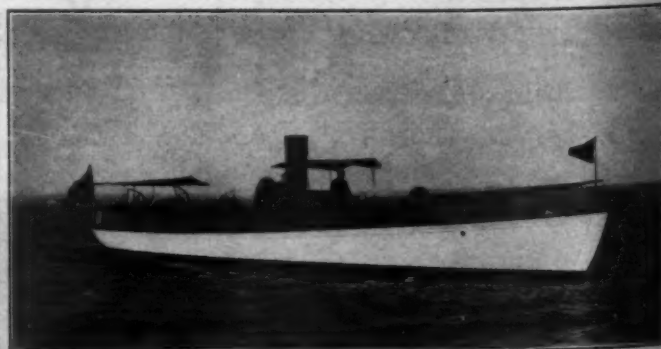
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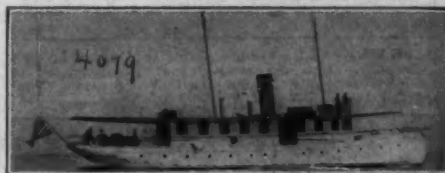
No. 4150.—90-ft. steamer, suitable for pleasure towing, inspection and commercial purposes. Heavy construction. Price reasonable.



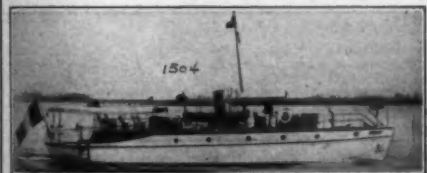
No. 4159.—100-ft. Steam Yacht, oil burner. Located Los Angeles, California. Two staterooms, saloon, etc. Exceptional bargain as owner just bought larger yacht.



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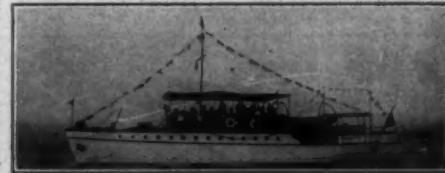
No. 4079.—Bargain. Steam yacht, 95 ft. x 17 ft. 6 in. x 4 ft. 10 in. draught. Six staterooms, saloon, bath, etc. Boiler two years old. Speed 10-12 miles.



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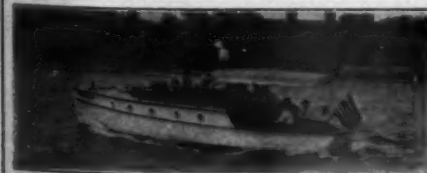
No. 864.—40-foot cruiser. Sleeps 4 to 6. 24 H.P. Lamb. Price reasonable.



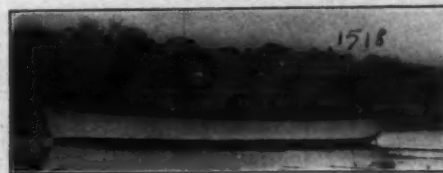
No. 1135.—41-foot cruiser. Stateroom and saloon. Sleeps 5 to 7. Price reasonable.



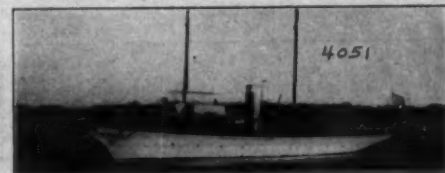
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for the
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EAST GREENWICH RHODE ISLAND

The Future of Restricted Class Racing.

(Continued from page 9.)

one, although not the most important by any means, is its importance from a spectator's standpoint. It is granted that motor boat racing never can be what might be called a howling success from the viewpoint of the gallery, yet even though this is conceded one must admit that it should be given due consideration.

If we are to base our decision that restricted class racing is the only correct method of handling competition between motor craft on the fact that it has been proven so by the success which has resulted from the existing classes, then our decision will not carry much weight with it from those who know. We must admit, however, that those restricted classes which have been tried out have proven successful in every way even though there really are only two places where this kind of racing has been given a fair trial. These two localities which we refer to are on the Mississippi and abroad.

Let us see, briefly, what has happened in each case. In English waters probably over 50 per cent. of all the motor boat racing which has taken place within the past four or five years has been among boats which belong to what is known as the International 21-foot class. Probably nowhere in this country can be found anything which has done more to develop motors and hulls of this type than the results of this 21-foot class have. The boats themselves are displacement boats in every sense and real sea boats too. When this class was first formed the maximum speed was in the neighborhood of 17 miles an hour and the latest boats show a maintained speed of 40 miles an hour with exactly the same restrictions. These restrictions are very simple—just a maximum length of 21 feet, a minimum beam of 3 feet 9 inches, and a maximum cylinder volume of 151 cubic inches. The side planking is limited to a minimum thickness of one-quarter inch and the boat must have a certain amount of decking. Some thirty-odd boats have been built to this class in England, France, Italy and other countries.

A speed of 40 miles an hour certainly is remarkable in a 21-footer with only 151 cubic inches of piston displacement. In a 4-cylinder machine this means a motor having a bore of 3 3/4 inches and a stroke of only 4 3/4 inches as a maximum. With a 2-cylinder machine a 4 3/4-inch size would be the maximum allowed. Of course, very high rotative speeds are necessary to obtain sufficient power and in some instances the revolutions were carried up to almost 3000 per minute. Propellers as small as 9 inches in diameter are often used with pitches of from 12 to 15 inches. Many close and interesting races were possible between boats of this class and meets were held at frequent intervals on British and Continental waters. A series of handicap penalties was imposed on the boats winning first, second and third places and also for failure to start; that is, a boat winning first place in a race would be obliged to give the other boats in all following races a small handicap based on her speed, say 5 seconds per mile or thereabouts. This kept the interest up among the non-winners and before the season was over gave them a good chance to come in for some of the prizes.

In this country we find restricted class racing largely followed in the annual regattas of the Mississippi Valley Power Boat Association and from more standpoints than one their events have been remarkably successful. Aside from their restrictions, they have followed a practice which has been generally discarded everywhere else in this country, and that is, the giving of cash prizes. Therefore, whether it is this latter fact or their arrangement of classes which has been the cause of their remarkable success we cannot say. But at any rate scratch racing appeals to the westerners, both racing man and spectator alike, and so it is probable that should the giving of cash prizes be abolished the annual regattas of this association would still be a drawing card.

The restrictions adopted by the Mississippi Valley Power Boat Association are based entirely upon piston displacement and nothing more. There are no restrictions of length or weight except that a boat may enter the next two higher classes only, but in the event of a boat winning a heat of a higher class, she may enter the next two higher classes. The practice followed by this association in their restrictions is radically different from that adopted by any other racing body as far as placing restrictions on piston displacement only is concerned. All the piston displacement measurements for these restricted classes are computed on the 4-cycle motor as a basis, the limits for 2-cycle being 12 per cent. less than that for 4-cycle motors. The smallest class of the Mississippi Valley Power Boat Association is limited to boats of any length or weight having a piston displacement of 256 cubic inches or less. Class B is limited to a piston displacement of 430 cubic inches, class C to a displacement of 695 cubic inches, and class D to 965 cubic inches. In addition to the above classes, this association makes provision for a free-for-all class which is open to all boats, irrespective of power or size, up to 40' over all length. No distinction is made in the above classes as to whether the boat is a displacement racer or hydroplane.

The American Power Boat Association for the last two years has provided restricted or limited classes, but very few races have been held for these classes, as there have been practically no boats built which would fit the limits. In the A. P. B. A. classes, besides maximum cylinder volume restriction we have a minimum weight restriction, and a minimum over all length limit. Each of these classes is further subdivided for displacement boats and hydroplanes, it not being deemed fit that the two types of boats should race together in the same class.

For the displacement boats the smallest class provides a minimum over all length of 16', a maximum weight of 1400 lbs., and a maximum piston displacement of 250 cubic inches for 4-cycle motors, and 300 cubic inches for 2-cycle motors. Boats of a greater length than 16' or weighing more than 1400 lbs. may enter this class, provided, of course, that their piston displacement is less than 250 cubic inches. For hydroplanes the minimum length for the smallest class is 14' over all, a minimum weight of 1000 lbs. and a maximum piston displacement of 250 and 300 cubic inches for 4-cycle and 2-cycle motors. The next larger class for the displacement boats limits the piston displacement to 400 cubic inches for 4-cycle motors, 300 cubic inches for 2-cycle motors, 25' as a minimum length, and 1800 lbs. a minimum weight.

(Continued on page 52)

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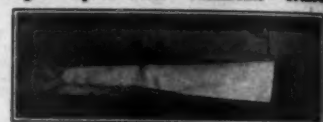
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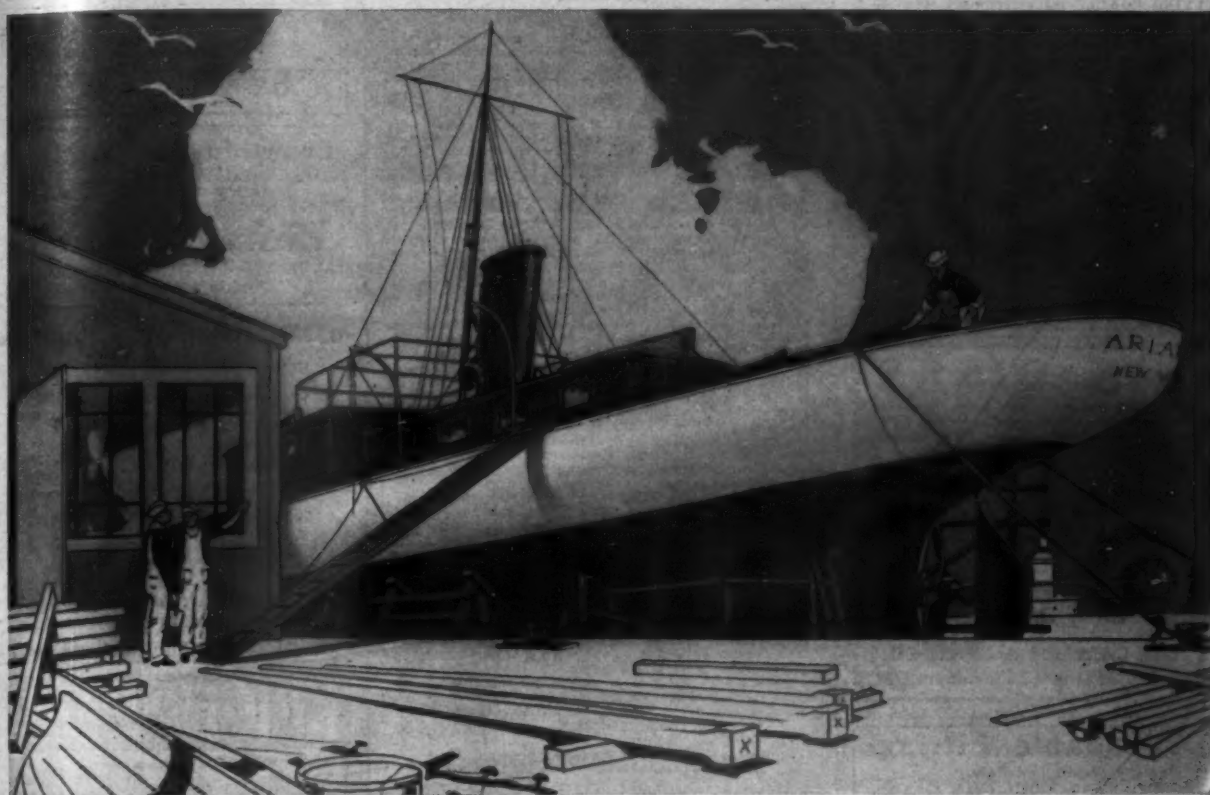
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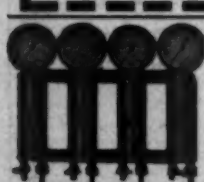
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Monitor Boat and Eng. Co.

Newark, N. J.

The Future of Restricted Class Racing.

(Continued from page 50)

In the next class the minimum length is 26', the minimum weight 2400 lbs., and the maximum piston displacement 580 and 435 cubic inches. The next class for displacement boats provides a minimum length of 32', a minimum weight of 3000 lbs., and a maximum piston displacement of 850 and 645 cubic inches for 4 and 2-cycle motors.

For the hydroplanes, we find a class with a minimum length of 16', a minimum weight of 1400 lbs., and the maximum piston displacement of 400 and 300 cubic inches. Then there is a 20' minimum length class, whose weight limit is 1800 lbs., and the piston displacement limit 580 and 435 cubic inches. The largest of the hydroplane classes provides for all boats of over 26' in length, 2400 lbs. in weight, and is limited in piston displacement to 850 cubic inches for 4-cycle motors, and 645 cubic inches for 2-cycle motors. Boats having a length greater than the minimum provided for the above classes or a weight greater than the minimum weight provided may enter any of the classes, provided their maximum piston displacement is not greater than that provided for the class entered.

The clubs on the Pacific Coast, and more particularly the California section of the A. P. B. A., are keenly interested in the question of restricted class racing at present, and it is probable that many of the races planned in connection with the Panama-Pacific Exposition will be of this kind. However, these racing men believe that the solution of the problem lies on a properly chosen set of restricted classes in which the principal limit is the maximum piston displacement of the motor. They believe in removing the restrictions as to length and weight, as they think it will develop a faster boat. As for the weight restriction, they are of the opinion that this will automatically take care of itself, as the boats of light and flimsy construction will not stand the strain. As regards the piston displacement, the westerners are of the opinion that the limits should be selected so that they will be multiples of each other, the idea being that if a 2-cylinder motor of a certain bore and stroke is able to meet the class requirements, that the 4-cylinder motor and even one of six cylinders of the same bore and stroke should fit the other classes equally well.

On page 35 we give a table of motors developing their power at 800 or more revolutions per minute, which are suitable for use in restricted class boats.

The Spanish Windlass.

(Continued from page 36)

Should all these attempts fail and it is imperative to the life of the vessel on those aboard to get her afloat, the next thing to do is to resort to the device known among "tall water" sailors as a "Spanish windlass." This gear properly rigged is one of the strongest purchases known, and if the anchor will hold and the lines are sufficiently stout to hold the strain it will be found far superior to any of the above mentioned schemes, as the average pleasure boat is seldom, if ever, fitted with tackles or the necessary gear for raising them. The sketches show the rigging of an improvised windlass which may easily be constructed from the necessary gear on board all crafts.

E. A. CRAWFORD, Newark, N. J.

Why I Believe in a Hydroplane Cruiser.

(Continued from page 15)

bow-plane, from the step forward, has a rapidly increasing dead rise and that the concave planes forming the V-section at the first step forward sharpen up and blend into the sides of the bow, yet with a corner or sufficient angle so that the water will break clean and be thrown outward, and not follow the bow surface, breaking up in the air and wetting the occupants, as with the displacement hull.

Increased speed in any vehicle, on land or in boats, means quicker action on rough roads, and it is to be expected that a hydroplane doing 35 miles is not going to run smoother than a round bottom boat doing 25 miles. Some of the old school architects spin some elaborate arguments in support of the displacement boat, but I have studied the subject considerably on my own account, and I believe that the V-bottom hydroplane, with concave planes, will prove the superior type of fast cruiser.

Speaking of speeds, I attended several of the races at Monte Carlo and saw Ursula, the Duke of Westminster's 50-foot, 800 h.p. displacement racer, perform in rough water. This boat, Ursula, is, beyond doubt, the cleanest lined and the most perfect displacement boat ever built, but I believe Maple Leaf IV or Pioneer could slow down to Ursula's speed and run just as smoothly on rough water. While I am responsible for the design of Pioneer and Maple Leaf IV, I think there is room for marked improvement as rough water boats and in speed. These boats were designed from theory and a limited experience with much smaller boats. I had not the advantage of model trials such as one can make at the United States Experimental station at Washington, and it was necessary to keep on the safe side and allow plenty of beam and not get the V-section too deep.

A sharp V-section tends to an easier boat in rough water, but too much V will cause the boat to heel from side to side and is dangerous. Unnecessary beam and width of planes causes the boat to pound and also decreases the speed.

Relative to the merits of hydroplanes and round bottoms, it is profitable information for the interested reader to weigh the examples of Ursula and Pioneer—Ursula, the 50-foot displacement boat; Pioneer, a 40-foot hydroplane.

Pioneer was driven with one of the engines taken out of Ursula. Roughly, the racing weight of Pioneer was that of Ursula, less the weight of one engine and its supply of gasoline, yet Pioneer was 8 to 10 miles faster than Ursula. Ursula was the pinnacle of displacement boat designing and engineering and had two years of tuning up and racing. Pioneer was an experiment and a rush job and never was properly tuned up, for want of time and other circumstances.

BODY SECTIONS AND HULL LINES.

In all the multiplane boats I have designed I have preferred not to rocker the bottom fore and aft, the planes at the step being in straight lines fore and aft.

(Continued on page 54)

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The Two Cycle Marine Engine

FERRO

A PLACE WINNER

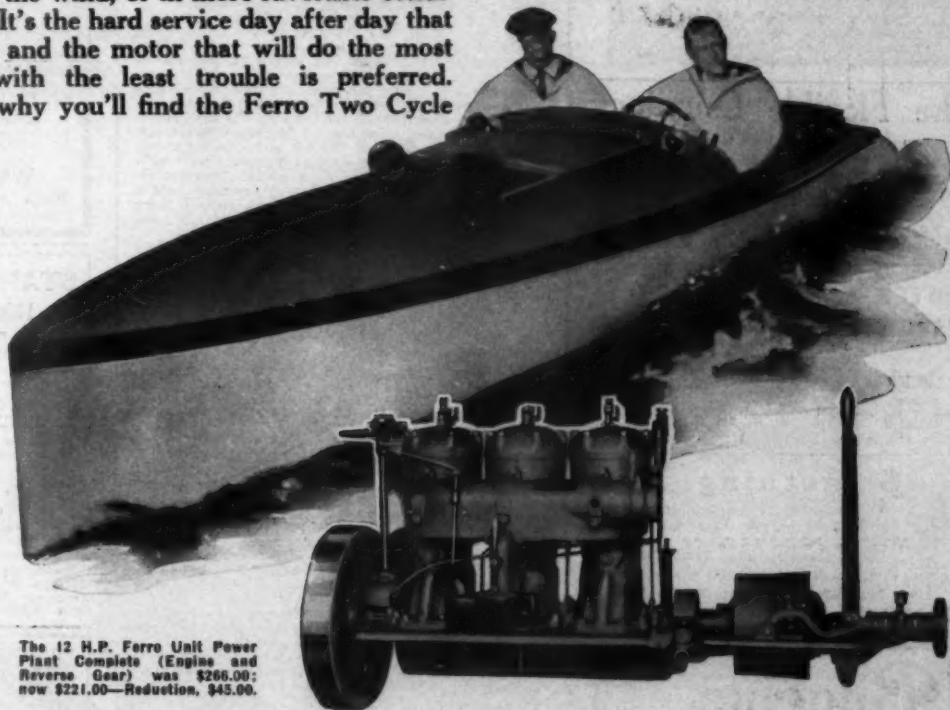
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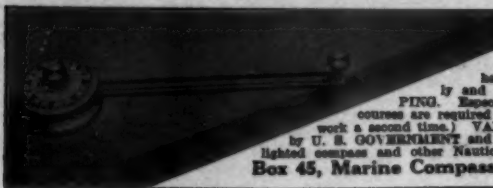
In acknowledging the co-operation of those who had helped her win, Mrs. Blackton said:—

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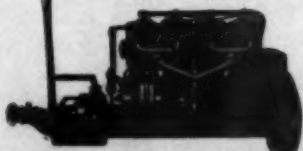
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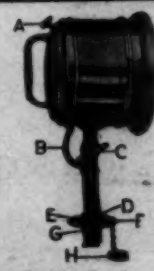
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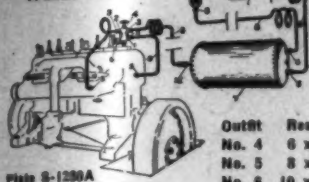


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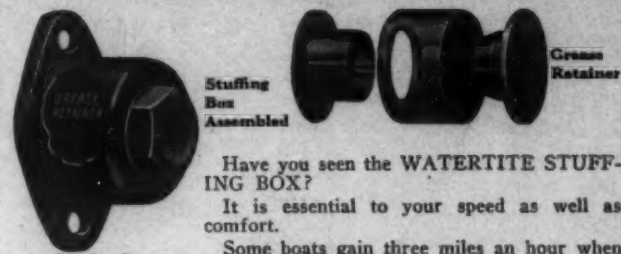
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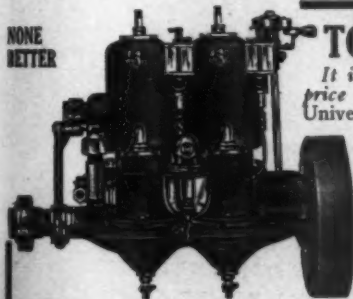
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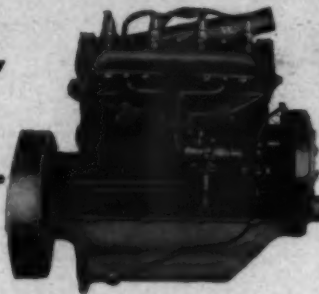
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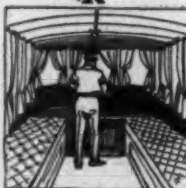
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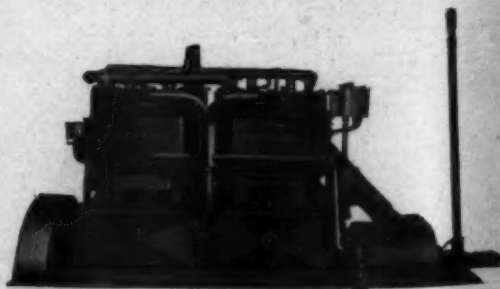
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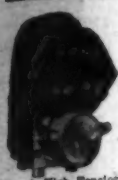
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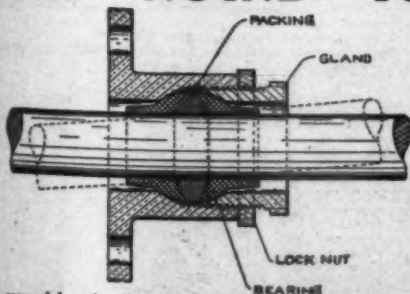
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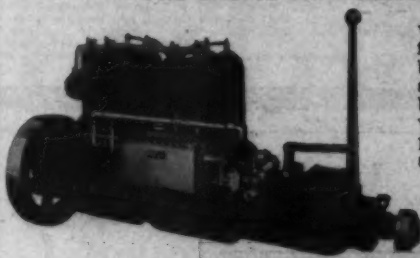
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Marine Motors and Their Design.

(Continued from page 13.)

ing has brought us to the type and size of cylinder, and the next step in order is the decision of whether we are to have individual, twin or on bloc castings. We are considering one size only, and in this particular instance are not confining ourselves to any manufacturing or pattern costs. There is some reason and excuse from a manufacturer's standpoint for an individual cylinder casting. He can make up stock cylinders from a simple pattern that is readily cast in ordinary foundries. He can have these single castings all machined ready to make up into 1, 2, 3, 4, 6, and 8-cylinder engines, with the minimum investment for patterns, such, jigs, etc., for a range of six sizes.

The individual cylinder requires a separate exhaust and inlet connection, also an inlet and outlet flange for the water. This makes four connections per cylinder, or sixteen in the case of our four-cylinder engine. With this form, a rigid base is desirable, so that the vibration may not extend to the connections, causing leaks in the water pipes and air leaks in the intake, which cause misfiring, especially at low speed, when the intake vacuum is greatest and the air is sufficient to dilute, below the firing point, the mixture going to the nearest cylinder without affecting the others. Owing to the room required for the water jackets and space between the single cylinders, this type requires more length for a given size than the en bloc or twin size.

The uniformity of water-cooling for the individual cylinder is a disadvantage. With twin castings the number of connections is cut in two and the manufacturer is still able to make up 2, 4, 6, and 8-cylinder engines from the same cylinder pattern. The water circulation is an easier problem and the engine is much more rigid. The cylinders in the twin castings can be brought together quite closely, and are sometimes siamesed together, although this is not good practice and is liable to result in scored cylinders at the junction, which is not protected by water.

Twin-cylinder construction lends itself to three-bearing crankshafts, or with a five-bearing shaft in a four-cylinder machine a narrow bearing can be used at the center of each casting.

The webs of a three-bearing shaft must necessarily be so thick to withstand gaping the distance between bearings, that, added to the length of a good middle bearing, this form of motor is practically as long as an individual form.

The ports for both cylinders in a twin casting usually converge into a single inlet and exhaust opening on opposite sides. In this respect the individual and en bloc castings have some advantages over the twin form, as it is possible in the two former to arrange for proper and uniform sequence of suction and discharge with no overlapping of valve openings in common parts.

Take the exhaust side of a T-head twin casting, four-cylinder engine—the two cranks for each pair are opposite each other—that is, when one is up the other is down. Accepted timing opens exhaust valves long before lower center and carries them open beyond upper center some 230° on the crank, equal to 115° on the camshaft. As the two cranks are only 180° apart (equal to 90° on the camshaft, due to its half-time ratio), it will be seen that if the first valve remains open for 115°, the second valve opens into the common port 25° before the first closes 115°—90°. When the exhaust valve opens there is usually a considerable terminal pressure, and in the case of the second valve alluded to opening before the first has closed, it interferes with the free exhausting of the first.

(Continued in the June number.)

Building a 13-Foot Sea Skiff.

(Continued from page 16.)

boat has been turned over. Nail a batten across the top to keep them in shape. The keel is of 1" x 2" oak or elm; the inside keel, being tapered from 1 1/2" to 4", is made out of 3/4" x 4" x 12'-0" oak or elm.

After you have these parts ready you can commence to assemble her. If you have a wood floor it will be a great help, but if you haven't, a couple of heavy planks will do. Make a center line and then point off the place for the stern, frames and transom. Fasten the frames down securely, then fasten the stern and transom to the two keels; turn them upside down, place the stern on the line and fasten it down to floor, doing the same with the transom. Fasten the keel to the frame with 1/2" galvanized bolts. After all is lined up straight and square, put in the chines, which should be made out of 1" x 1 1/2" oak, elm, hard pine or spruce. The bevel on both the inside keel and the chine can be put on when the planking is fitted. Then put in the battens and gunwale strips.

You are now ready for the planking. This should be of clear cypress or cedar, 3/4" x 9" x 14'-0". Fit the garboard or plank near the keel first, clamp it down in place as nearly as possible and mark around with a pencil. Let it lap half way on the batten. Take it off and trim it and if it does not fit the first time clamp it down again and mark and retrim.

The bottom boards may be a little hard to bend at the bow, and a little steaming will help. If no steam is convenient, soak the end in hot water, or pour boiling water on the board while it is being clamped in place. After the plank is clamped in place, fasten with No. 12 brass screws. Having drilled for the screws, turn them in till the heads are just flush with the board. Put in three at each frame and set them at 3-inch intervals on the battens and keel. Follow the same procedure with the other planks. Bevel the edges of the planks so that they will be open about 1/16" on the outside for caulking and tight inside.

After the planking is all on, turn the boat over and cut off the frames even with the sheer line, first putting in spreaders to keep the boat in shape till the decks are on. The deck boards can be put crosswise and caulked or covered with canvas if preferred. The coaming can be of oak or cypress and is three inches high on the sides and four and a half in front.

Put in the seats and oarlocks and your craft is ready for finishing. Putty the joints flush and give her three coats of spar varnish, or she can be painted white on the sides and deck, lead color inside and natural finish on the coaming and seats.

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Motor Boating's Market Place columns offer the buyer and seller of used motor boats, fittings, etc., a quick and convenient medium of exchange.

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The ideal craft for recreation and utility—
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Starts without cranking. Built in 2 1/2, 4, 6 and 8 H.P., 2 cycle. Runs in either direction. Reverses while running. One lever controls speed. This type adapted for use on hand cars for section men, etc.

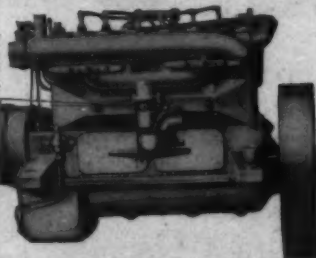
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Starts without cranking. Built in 8, 12, 16 H.P. Two cycle. Runs in either direction. One lever controls speed.

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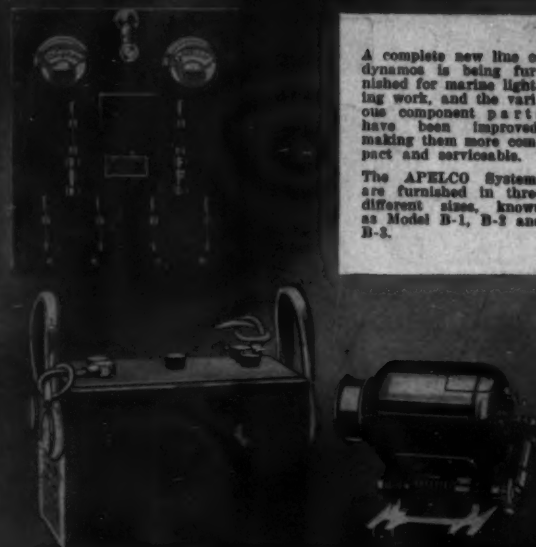
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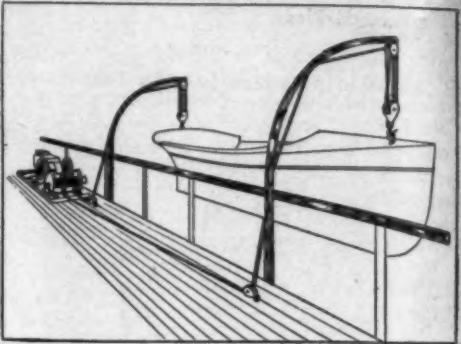
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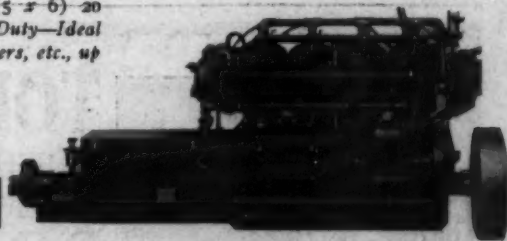
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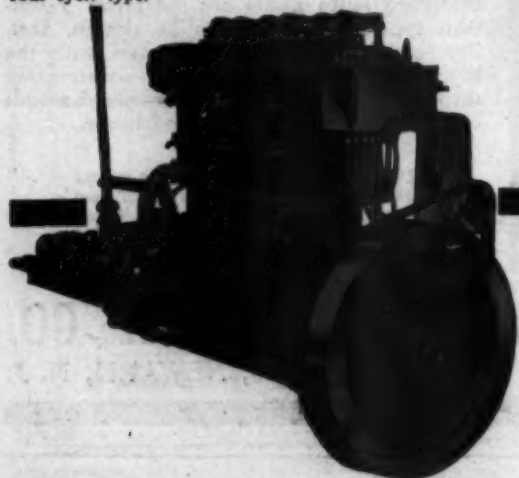
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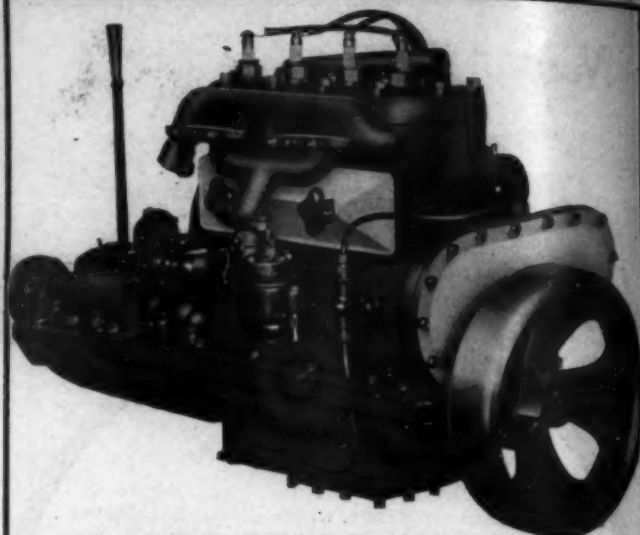


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We also have a large number of second hand motors on hand—overhauled, rebuilt and guaranteed. This stock is constantly changing.


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
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Our 67 years' experience in making marine fittings and appliances is your guarantee that every article bearing the  mark will stand the test of long service. Look for it when buying anchors, wheels, steerers, deck plates, rowlocks, compasses, hooks, cables, port lights, etc.

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Sturdily made of the most dependable bearing metal, with ample packing space, accurately machined by specially designed tools to fit the various shafts.

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The Highest Grade Engine of Its Kind Ever Built

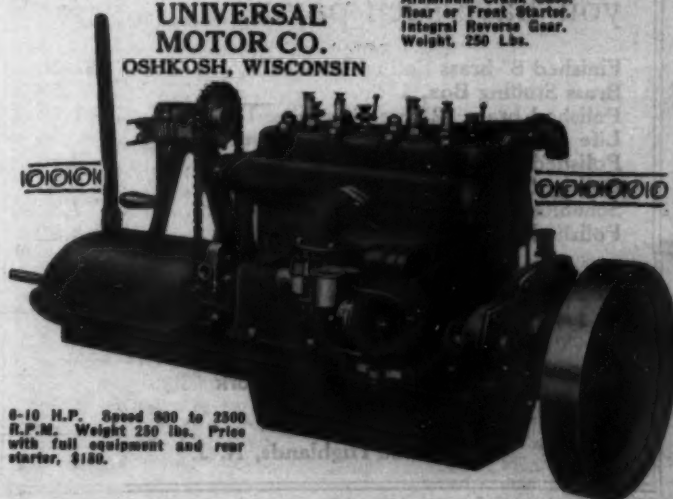
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The SHAW
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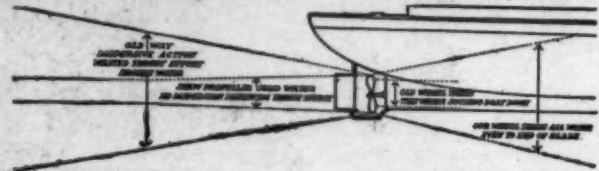
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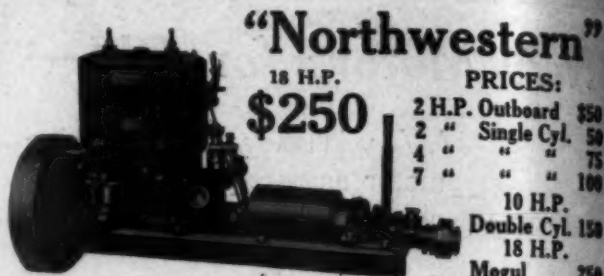
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"Northwestern"

18 H.P.

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The most powerful, compact and reliable engines for their size in existence. Not in class with the flimsy built high speed engines that are over-rated in horsepower and with innumerable springs, cams, gears and parts to rattle loose and give trouble, but heavy service, high duty engines of medium weight and extreme compactness. Highest grade float feed carburetors, flange couplings, electric circuit break reverse levers, plunger pump brass fittings throughout, Northwestern spark and waterproof commutators without beveled gears or complicated timing devices. Northwestern

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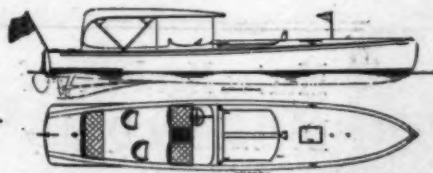
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Eau Claire, Wisconsin



8-Passenger Runabout

No finer boat of its type is built. 26 ft., V-bottom. Speeds 16-32 m.p.h. Prices \$1000 to \$2500, with full equipment; depending on power. With El Sterling or Model 30 Low-Victor engine and rear starter speed 19-21 m.p.h. \$1600. Electric starter \$140 additional. Prompt Deliveries. Standardized 45 ft. 6 in. x 9 ft. 8 in. x 2 ft. 6 in. Raised Deck Cruiser. Fast, seaworthy, comfortable; accommodations for 7. One man control; electric light, running hot and cold water and complete equipment. With 25-35 h.p. Sterling engine, speed 16 m.p.h., \$4500. With 30-50 h.p. Sterling, speed 18 1/2 m.p.h., \$4800. Prompt deliveries. We also offer a standardized 31-foot V-bottom hunting cabin cruiser at \$2500. Prompt deliveries. Houseboats, speed boats and other craft to order.

Raised
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Cruiser



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Then why pay at least that amount to a dealer in commission for just a minute of his time in writing out your order for marine motors?

Write it out yourself. Send it to us, and we'll put the dealer's commission in your own pocket for

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Furthermore, we buy raw materials and manufacture on a large scale. This enables us to give you the best the market affords at less than others charge for inferior materials and workmanship.

The American Outboard Motor

Can be instantly attached to any rowboat. Runs 6 to 9 miles an hour. Adjustable for any angle or depth of stern. Reversible. Weighs about 50 lbs. Runs in salt or fresh water. Steers with propeller. We also build a rudder steered model. Magneto ignition if desired at small extra cost. Every motor fully guaranteed. Send for catalog "B."

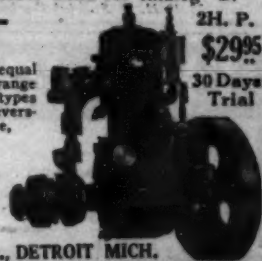
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Every one is absolutely high grade and equal to motors selling at 25 to 50% more. Sizes range from 2 to 30 H.P.—regular and heavy duty types in one to four cylinder designs. All are reversible and can be furnished to run on gasoline, kerosene, or other fuels. Each is

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2H. P.
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30 Days
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COMPLETE WITH SINTZ REVERSING PROPELLER

Giving Multiple Speed Control not only makes any boat a motor boat—but a motor boat of unrestricted speeds, both forward and reverse. From the swiftness of 8 to 10 miles an hour, you can slow down to an imperceptible drift and into reverse at any rate you desire, without discomforting jerks and shudders. Think of it! A rowboat motor with the flexibility of a throttle controlled steam engine!

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The Waterman Porto develops 2 h.p. Weighs 65 lbs. Fits any shape stern. Has automobile carburetor, not a "mixing valve"; removable bearings; solid bronze she protecting 10 1/2 x 16 inch propeller. Steers by rudder from any part of the boat. Water cooled exhaust manifold; noiseless under-water exhaust; open copper water jacket. Ignition by high grade high tension magneto. And guaranteed for life.

These are not features, but essentials. As such, demand them in your rowboat motor, or you will not be getting full value for your money.

Write today for free Marine Engine Book containing full information on our full lines of engines. We ship to you directly from the factory, insuring immediate delivery.

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**1915
Model
With
Reversing
Propeller
and
Multiple
Speed
Control**

WOLVERINE
THE MOTOR WITH THE BORE AND STROKE

For **MARINE SERVICE**
FUELS (KEROSENE (PARAFFIN)
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points and degrees. Outfit includes felt lined mahogany case. Patent allowed. Liberal introductory offer.

Avoid disaster by using a DIRIGO compass on that boat. All materials first class. No rubber gaskets to rot. Navy Degree Circle on dial. A very hard pivot and high grade jewel assure accuracy and long life. SPECIAL a inch DIAL, OIL COMPASS sent on approval for \$4.25. Send for new complete catalog of all sizes. Manufactured by **EUGENE M. SHERMAN**, Box 3, Bellevue P. O. SEATTLE, WASH.



30-60 H. P. Special Engine built for U. S. Govt.

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Our No. 1 Model "E" Gear is made the same as previously

Reasons Why these Reverse Gears are Superior:

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Guaranteed for ONE YEAR

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Portable

Boat-Drive

Makes a
Row Boat
a Go-Boat

2 and 5 H. P.

Takes You
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PRICES

- 2 H. P. Strelinger Boat-Drive, ready to run, for fresh water \$69.00
 - 5 H. P. Boat-Drive, ready to run for fresh water..... \$99.00
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- Magneto instead of battery equipment, \$15.00 extra on both sizes.

Everything Strelinger makes, takes. When the Strelinger Portable Boat-Drive came out, history repeated itself.

¶ Made in three parts—easily transported.

¶ Has a Strelinger "regular" engine.

¶ Gasoline tank holds one gallon—enough for six hour run. Detachable for filling if you have to go ashore.

¶ A child can handle it. Very simple.

¶ Adjustable propeller. Raise or lower at will. Great when going over shallows or through weeds, upon the beach, etc.

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¶ These and many other points proving superiority are contained in our special Portable-Drive Folder. Free—send today.

Strelinger Marine Motor Co.

501 Strelinger Block

Detroit, Mich.



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May 10th

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1 and 2 K. W. Automatic Lighting Plants for yacht and home use. The plant that is remarkable for compactness, dependableness, and efficiency, sold on a guarantee of absolute satisfaction. Deliveries on late summer and Florida cruisers can be made on orders now placed. Photographs and plans of the boats furnished to those interested. Write the

MATTHEWS BOAT CO., Port Clinton, OHIO
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The 18 H. P. Heavy - duty engine is designed primarily for fishing boats and cruisers of about 35 to 45 feet in length, and is a fair sample of the REGAL line of working and cruising

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Regal Gasoline Engine Co.
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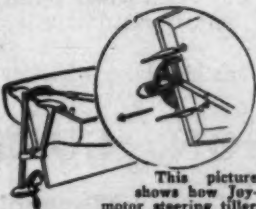
Reversing Propeller

The exclusive patented feature of Joy Motor that makes it the safest, most convenient, easiest to handle motor in the world. No more danger of accidents. No drifting or paddling to dock or shore. No more awkward, hurried cranking to reverse the motor. Just move the steering tiller to right or left and Joy Motor almost instantly—

STOPS YOUR BOAT AND BACKS IT UP WITHOUT REVERSING THE ENGINE

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Joy Engineering Company
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This picture shows how Joymotor steering tiller swings and reverses position of propeller. Compare this position with large picture.

HIGH QUALITY LOW PRICE MORRISTOWN

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If you have a hydroplane, fast runabout or cruiser requiring 20 to 30 H. P. this is just the engine you want—the best buy on the market. It is up-to-the-minute in design, with the finest materials and workmanship, and every desirable feature of construction and equipment.

This motor is ideal for boat builders as it gives the highest quality at a very low price. It is guaranteed to develop full brake horsepower and weighs just 525 lbs., with full equipment listed, ready to run.

\$450.00 Net F. O. B. MORRISTOWN, N. Y.

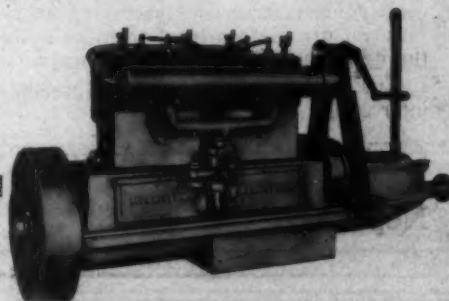
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Two Cycle Motors, 4 to 15 H. P.

Morristown Boat & Engine Works

Morristown, N. Y.

Weight, 525 lbs., complete.
Aluminum Crank Case.
Heavy Crank Shaft.
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Many Other Features.



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We are the manufacturers of the well known Comet Magneto, and there are thousands of them used for ignition and lights on motor boats. Sixteen years experience in magneto building has enabled us to produce the Eureka lighting outfit.

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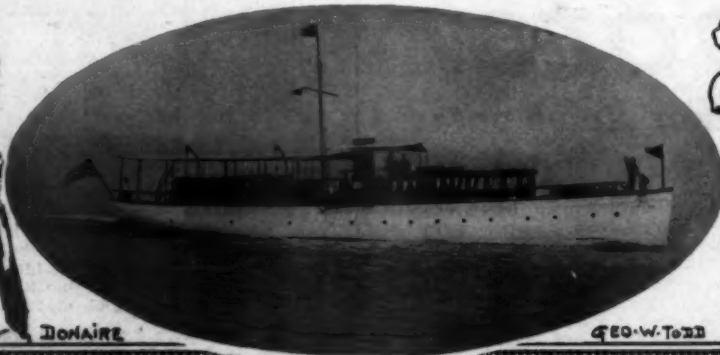
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Eureka Jr. B C 2 with automatic cut-out. Ball bearings throughout



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Let us send you our illustrated catalog, showing some of the best known Lawley Boats. You will find it interesting.

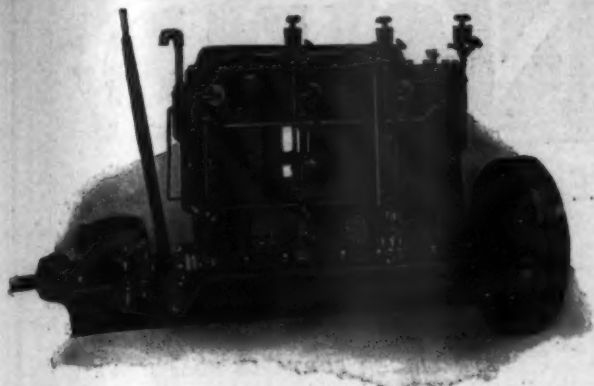
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"The Automatic"

Four-Cycle Marine Engine

Built in sizes ranging from three to two hundred and fifty horse power, with one to six cylinders, the AUTOMATIC is suitable for any craft — launch, cruiser or commercial boat — that you may have.

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The Motor that Sounded the Death Knell of the

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AS the one-cylinder automobile passed rapidly out of existence with the advent of the improved two-cylinder cars, so the death knell sounded for the one-cylinder, outboard marine motor with the introduction of the

Perfectly Balanced, Vibrationless, Two-Cylinder, 3 H. P.

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No Water too
Shoal
No Weeds too
Foul

Propeller
Swung Clear
of the Water

You can sell it.
We co-operate with you.

Our Catalogue Gives information about detachable motors not obtainable elsewhere. Send for your copy today. We have a bracket adapting any detachable motors to canoes. Our Trolling equipment can be furnished for all motors.

Two opposed pistons
control lateral cylin-
der eliminating all vibra-
tion.

Placed bracket permits
swinging motor forward,
propeller, up and down
out of water. Unnecessary
to remove motor when
beaching boat, etc.

Vertical Adjustment for
motor shaft.

Locking down of motor
allows motor to remain
down from grounding.

Head on steering cable
allows extra length of line
permitting steering and
reversing from any part
of boat.

Double capacity pump
pumps water into large
water jacket. Water
cools and keeps motor
cool.

Adjustable thrust bearing.

Each high tension, water
proof Magneto geared to
shaft.

Solid cylinder head—no
packing joints.

Exhausting device to catch
any leaking water prevent
it all escapes to stern.

Steel bracket—not cast
iron.

Clamp bracket for deep
cut, knee and stern,
mounted if desired.

Adjustment to any angle
of stern.

Under water exhaust if
desired.

Stowed by propeller. Re-
verses by turning propeller
all way around by same
means and action used
for steering. Stops and
backs level in variety of
angles without handling
motor. No gearwork in
housing. Controlled from
any part of boat.

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Newark
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MARINE MOTORS — RELIABLE FIFTEEN YEARS

WITH human beings, you look upon age with respect and confidence. The experience of age is something with which the most vigorous and buoyant youth cannot compare. Youth must prove itself—age has done it. Likewise, age in a motor means stability—assures reliability—dependability.

We have been making Strelingers' for 15 years. Experiments — tryouts — weaknesses — impracticabilities — uncertainties, have long ago been swept away. Strelinger purchasers don't have to guess—or hope or wonder, they know that The Strelinger will deliver what is wanted and expected of it.

STRELINGER 4 CYL. HEAVY DUTY ENGINES

for freight and passenger service—Tugs and all forms of heavy duty work.

The Strelinger is rapidly displacing the steam engine and the sail. Tests made in the Gas Engine Department of the Cornell University showed that The Strelinger used less fuel per H.P. per hour than any other engine ever tested there. Accurate records show that for the past eleven years the cost per engine for repairs has been less than \$3.00 per year.

Approximately 40% fewer parts than any other engine of this type. Built in 1, 2, 3 and 4 cyl. from 6 to 40 H.P. furnished with Make and Brake or Jump Spark ignition.



"LITTLE GIANT" STRELINGER 2 CYL. ENGINES

Built in one and two cyl. models, from 1½ to 20 H.P. For general utility this engine is unsurpassed.

STRELINGER PORTABLE BOAT DRIVE

Most of this type of portable, detachable rowboat and canoe motor are good for about a year. The Strelinger is fully guaranteed for five years. The motor is one of our standard models, which we have built for twelve years. Like the rest of Strelinger motors there is nothing experimental about any part of the outfit. Supplied in two and five H.P. magneto or battery ignition. Any of the parts are easily assembled or easily taken apart. The simplest and most satisfactory outboard motor. Propeller may be adjusted to any angle, can be lifted to surface when running over weeds, over rocks or any shallow place. Can be raised from the water without stopping the motor.

KEEN, LIVE AGENTS AND DEALERS WANTED

Strelingers have the name, the reputation, the age, the quality that make ready sales and satisfied customers. Satisfied customers talk—that means more business—tie up to the Strelinger line and you will be in right. Write today for the complete Strelinger catalog and prices. (You'll be glad when you know more about Strelinger Engines.)

STRELINGER MARINE ENGINE COMPANY
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Two Cycle and Four Cycle

MARINE MOTORS

GOOD MOTORS—AND THEN SOME

Knox Motors are more than ordinarily good motors. They are the best motors built, in their respective classes and types. That is a strong statement, but the proved reliability, economy and other advantages of these motors have warranted such a statement.

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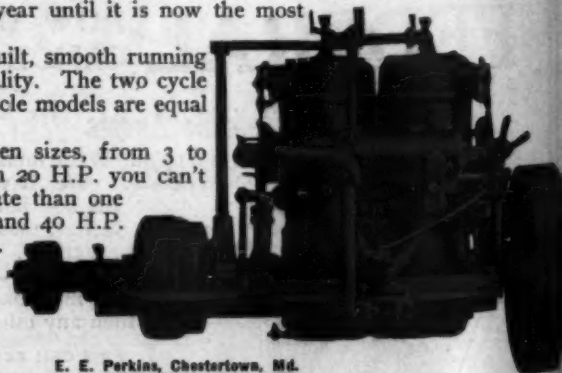
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We Guarantee **1 to 3 Miles Per Hour**

To Increase the Speed of Your Boat

This is the guarantee we have been making for the past five years, the guarantee under which we have sold thousands of B. & B. propellers. This is your protection and insurance of satisfaction when you buy a B. & B. wheel. You don't have to depend on argument or unfounded claims. B. & B. propellers give you the highest degree of speed and power your boat and engine are capable of. Their efficiency is as near perfection as it is possible to attain. They reduce the percentage of slip and produce the maximum propelling force for the horsepower used.

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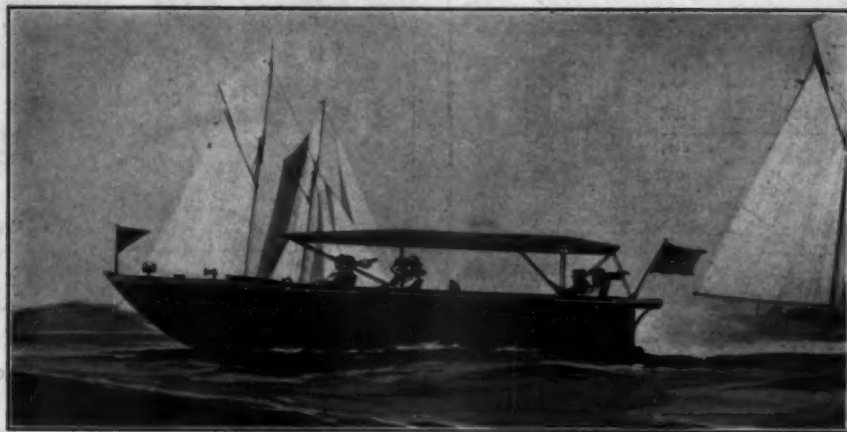
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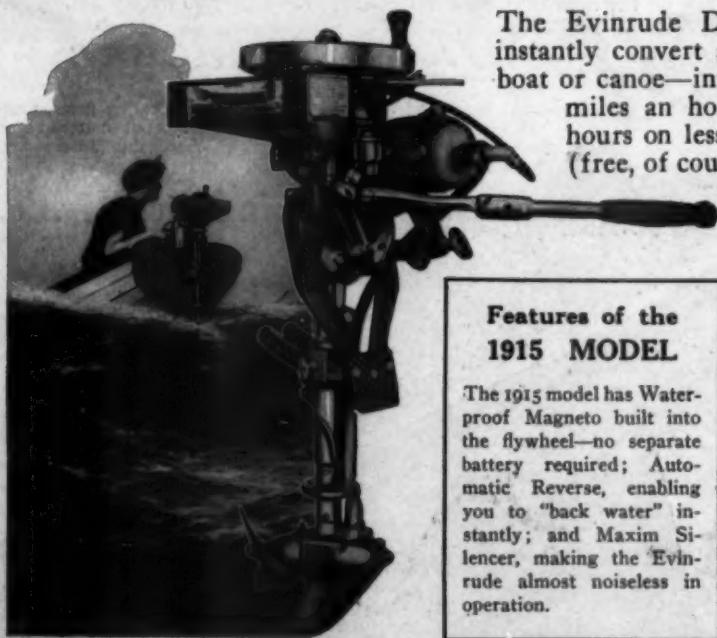
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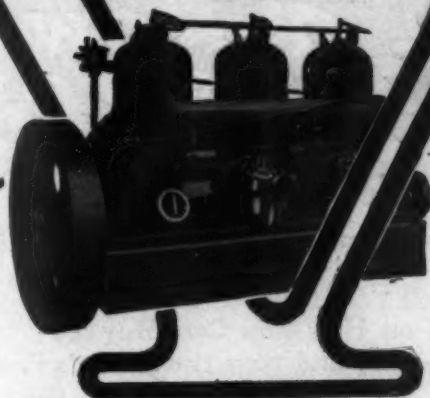
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1, 2 and 3 Cyl.
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1 cyl.....	6 H.P.
2 cyl.....	12 H.P.
3 cyl.....	18 H.P.

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2 cyl.....	10 H.P.
2 cyl.....	18 H.P.
3 cyl.....	15 H.P.
3 cyl.....	27 H.P.

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11"	2.10	2.60	12"	3.30	3.80
12"	2.28	2.79	14"	4.20	4.70
13"	2.70	3.20	16"	5.70	6.30
14"	2.88	3.39	18"	6.90	7.56
16"	3.90	4.50	20"	9.00	9.78
18"	4.95	5.60	22"	10.80	11.70
20"	6.60	7.38	24"	13.80	14.82
22"	8.10	9.00	26"	16.80	18.15
24"	9.60	10.62	28"	20.40	21.90

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Diameter	Net Price Unbored	Net Price Bored	Diameter	Net Price Unbored	Net Price Bored
10"	\$.75	\$1.20	10"	\$.88	\$1.33
11"	.88	1.39	12"	1.38	1.89
12"	.95	1.46	14"	1.75	2.26
13"	1.08	1.59	16"	2.38	2.98
14"	1.20	1.70	18"	2.88	3.54
16"	1.63	2.23	20"	3.75	4.53
18"	2.08	2.74	22"	4.60	5.40
20"	2.75	3.53	24"	5.75	6.77
22"	3.38	4.28	26"	7.00	8.35
24"	4.00	5.02	28"	8.50	10.00

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The Great 2-Cylinder KOBAN ROWBOAT MOTOR

If there is any satisfaction in having a smooth, quiet motor, without the shake—one that you can point to with pride for looks, mechanical excellence and performance, then the pleasure is yours if you select a Koban. Has two opposed cylinders which fire simultaneously. This explains the absence of vibration. Simple, easy to understand, easy to start; reverses by simply pressing a button.

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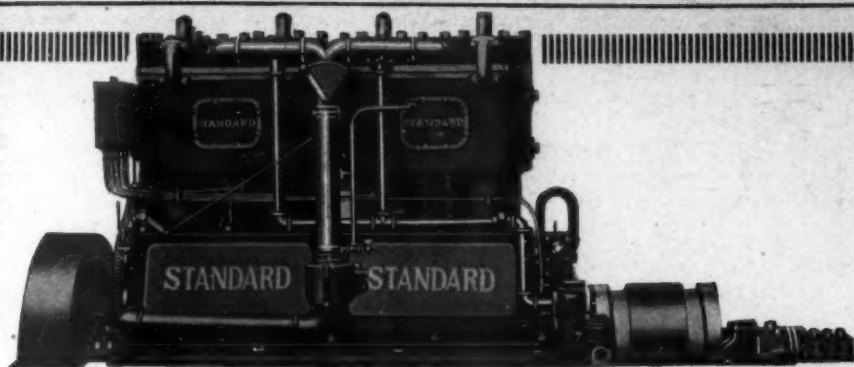
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without the sacrifice of yacht and work-boat essentials.

Its quietness is in the perfect balance and synchronism of highly developed working parts.

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This really practical, low cost engine is the result of honest, steadfast building-up of parts as time and service show the way to each.

The 1915 model has every feature proven scientifically and mechanically worth while in a marine engine. Every improvement, every convenience, is embodied in this up-to-the-minute machine without fads or fancies. Write for 1915 catalogue.

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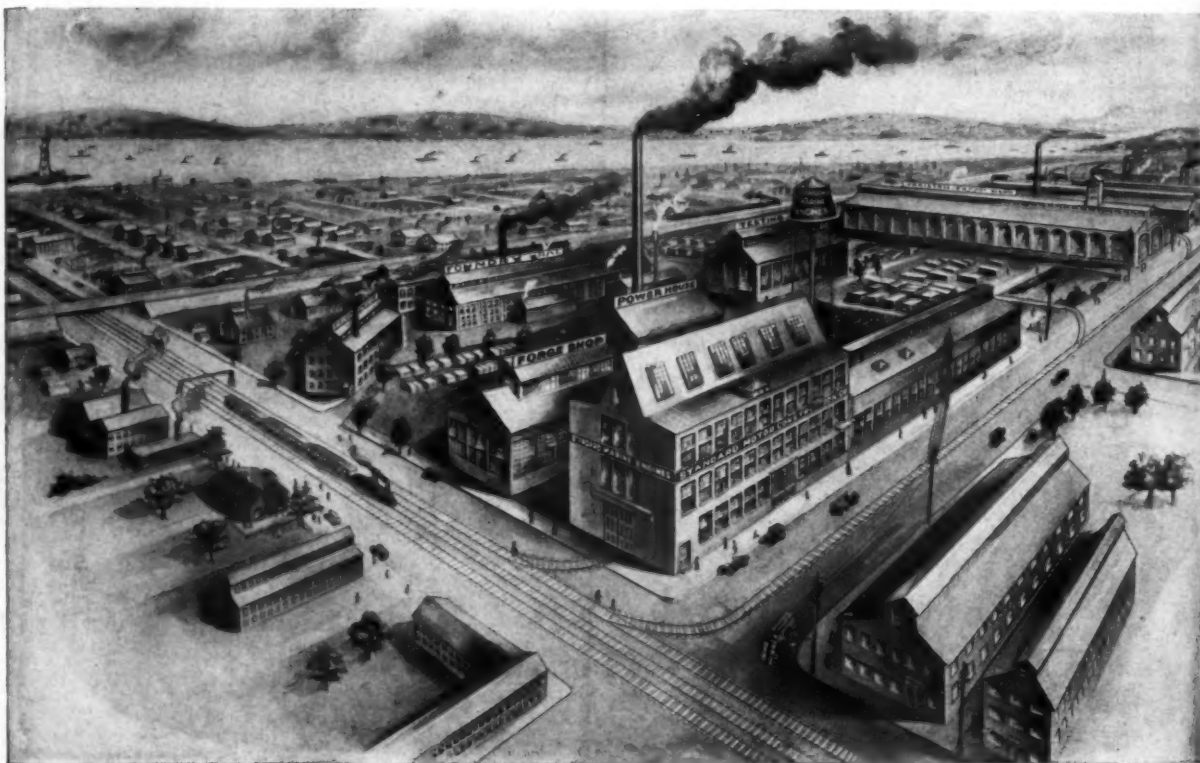
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This plant represents an investment in money and experience vastly greater than that of any other concern making marine gasoline engines only.

It comprises equipment for each department in its every detail for the making of the complete engine; perfect facilities for making it in numbers, with quickest dispatch and greatest uniformity, and the time-earned knowledge of how to make it right.



In this plant, where only STANDARD Engines are built, where every part is made under the one roof, every thought and effort concentrated on this engine to make it pre-eminent, engine and plant have grown together, each has necessarily kept pace with the other in up-to-the-minute features and developments.

This is how the STANDARD is made a BUILT-UP engine of highly developed parts, strikingly in contrast with the assembled engine composed of parts made here and there for widely varying purposes.

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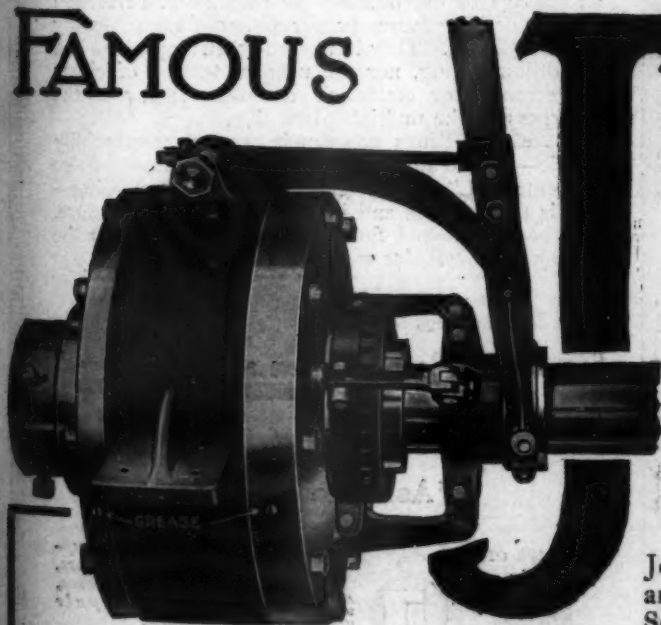
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70 H.P., 6 cylinder, 4 cycle Thelma, 1914 model 750.00	15 H.P., 20th Century, 3 cylinder, 4 cycle, complete 350.00
60-70 H.P., Holmes, $6\frac{1}{2}$ x $8\frac{1}{2}$, heavy duty, full equipment 800.00	14 H.P., Palmer, 4 cylinder, 4 cycle, $4\frac{1}{2}$ x $4\frac{1}{2}$, complete 275.00
70 H.P., 20th Century, 4 cylinder, 9 x 10, heavy duty, complete 1,200.00	12-14 H.P., Monarch, 2 cylinder, 4 cycle, complete 300.00
60-70 H.P., Buffalo, 6 cylinder, 7 x 9, heavy duty, complete 1,300.00	12-14 H.P., Automatic, 2 cylinder, 4 cycle, $5\frac{1}{2}$ x 7, complete 275.00
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50 H.P., Automatic, 4 cylinder, 1912, $7\frac{1}{2}$ x 9 1,150.00	10-12 H.P., Standard, 2 cylinder, 4 cycle, 5 x $6\frac{1}{2}$, complete 325.00
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REVERSE GEARS

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Joe's Reverse Gears make good through years of steady and reliable service. Their reputation is unexcelled. Select Joe's and rest easy.

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Joe's Duplex Friction Drive Gears

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They do not depend on locked gear teeth for forward drive.

Joe's Positive Neutral One-Way Clutches

for high speed motors

Joe's High Power Gears

for fast and medium speed motors

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with frame or bulkhead bracket.

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You don't want a lighting system that requires a lot of attention—you have enough mechanism to look after.

You don't want a lighting system that frequently requires the services of an expert electrician—that may fail when you are far from help.

You do want a system that is simple, reliable and *actually* convenient.

Can be Installed on Any Boat

Prest-O-Lite installation is very simple. Any average mechanic can do the work in a few hours.

When once installed, Prest-O-Lite requires practically no attention. There is no clutter of dynamos, batteries, switchboards or wires—no delicate connections or mechanism to get out of order.

Anyone can understand and operate Prest-O-Lite. Prest-O-Lite has been proven by years of satisfactory service to be the most convenient, dependable and economical light for all kinds of boats.

It costs less to install and is more economical to operate than any electrical system.

Prest-O-Lite in different sizes gives an abundant supply of light for any size of boat.

It is in use on the finest boats for seachlight, port and starboard lights and cabin fixtures.

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Prime it with acetylene. The engine will start, without fail, even in zero weather, on two or three slow, easy turns of the crank. The Prest-O-Primer uses acetylene for this purpose, at low pressure, and uses it in a "thin" mixture, which has just the same effect on an engine as a "thin" gasoline mixture. The advantage is that acetylene, being a ready-made gas, furnishes a fuel that ignites unflinchingly in any weather.

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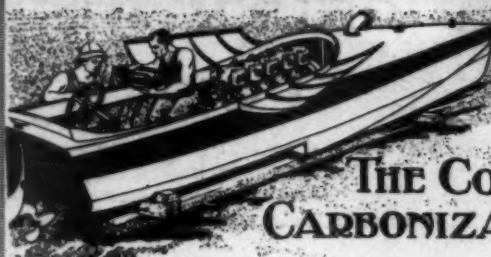
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Look for the name **LEAK-PROOF** stamped on the Ring



CARBON deposit is more than merely an annoyance. It is an evil—and an expensive one.

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Every part that goes into a Wisconsin motor is standardized—the very best part for the purpose. The Wisconsin waterproof Reversible High Tension Magneto insures a hot spark at all speeds. The Rudder Steering on the Wisconsin De Luxe gives complete control of the boat after motor is stopped. The Wisconsin in water-cooled Silencer insures a noiseless operating motor—without loss of speed.

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The Wisconsin Junior represents the best ideas in rowboat motors and has many exclusive advantages—you can attach the Wisconsin to any boat in two minutes. Our patented adjustment at top of motor enables you to keep the propeller shaft in alignment without moving from your seat. Practically every ounce of power developed is delivered to the propeller. The motor starts with a half turn of the fly wheel. No missing fire. You don't have to tire your arms by steering—the self-locking tiller holds the boat in the direction you want to go. No other motor has this. The Rudder steering on the Wisconsin De Luxe eliminates the propeller thrust and gives control of the boat when engine is still. Investigate all motors—dig into the specifications fearlessly—and you'll choose the Wisconsin for its superiority. From every viewpoint—economy—speed—reliability—the Wisconsin leads. If you buy a motor this summer, make sure of speed and service by specifying a Wisconsin. Write today for Catalog M and prices.



Wisconsin De Luxe. Independent rudder for steering. Noiseless. Weight, 30 lbs.

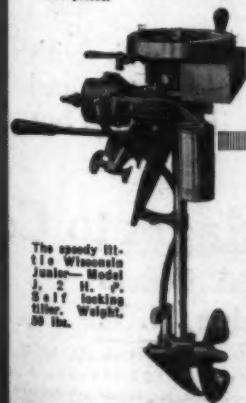
Wisconsin Machinery & Mfg. Co.

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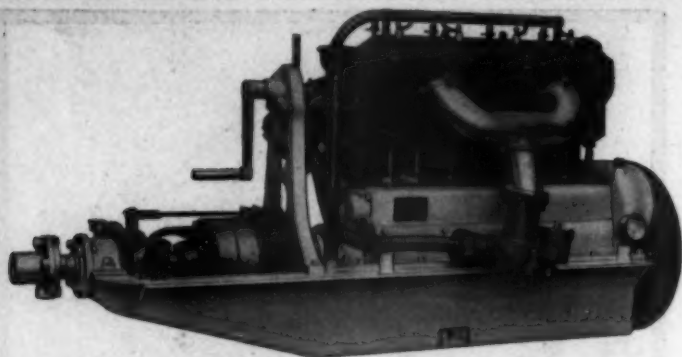
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This four-cylinder engine of 4½-inch bore and 6-inch stroke weighs 650 pounds and measures 24 inches in length over the cylinders. There is nothing unusual about that.

The remarkable fact is that it is rated at 75 h.p. instead of 40 h.p., which is usual for an engine of this size.

Furthermore, it is guaranteed to develop this power continuously in service.

And yet this is not in any way a purely racing motor, but designed for every-day use in runabouts and speed boats, where light weight, high speed and absolute reliability are required.

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Marine Motors

embody new ideas which have never before been applied to marine engine design.

Three EXCLUSIVE STURTEVANT FEATURES have solved the problem of the high-speed marine motor.

TWIN VALVES, HIGH PRESSURE LUBRICATION and RECIPROCATING PARTS weighing ONE-HALF those employed in any other motor of the same size.

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Up to the present time it has been impossible to establish manufacturing conditions in the United States that would warrant us in departing from the automobile and truck fields.

But now we have finally reached a position where we can not only care for our extensive business in this field (more than eighty manufacturers in this country alone now use Eisemann equipment as standard on their products), but can branch out into other fields as well.



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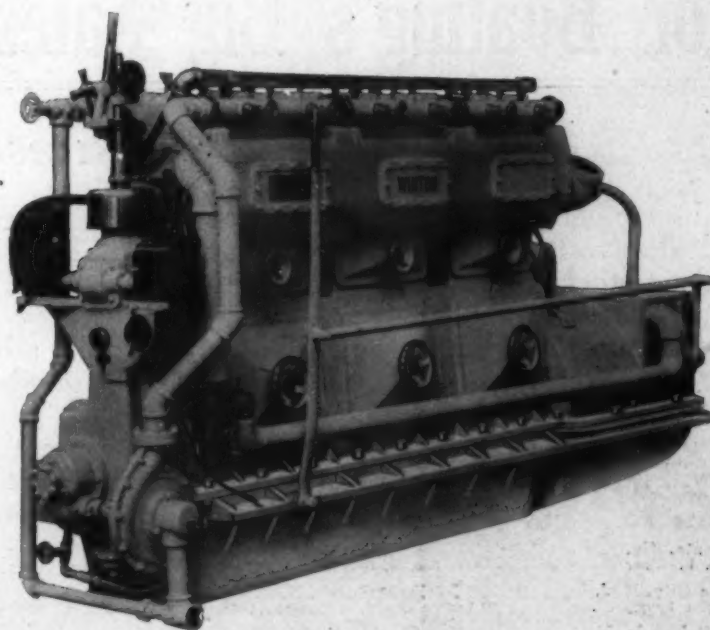
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The Winton Engine has solved the problem for others, and can do the same for you. If you are not satisfied with the performance of the engine you now have or are contemplating a new boat, permit us to make you acquainted with the superior qualities of the Winton Engine.

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You Install
will Decide
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Palmer Engines for 1915 will be built in three distinct types—two-cycle two-port, two-cycle three-port and four-cycle models, thus giving the best and most economical size and style of motor for every class of marine service.

Palmer Marine Engines have won an enviable reputation for their advanced design, honest construction and reliable service, wherever marine engines are known or used. They have always been leaders in their field, originating many principles of construction which are now accepted as fundamental.

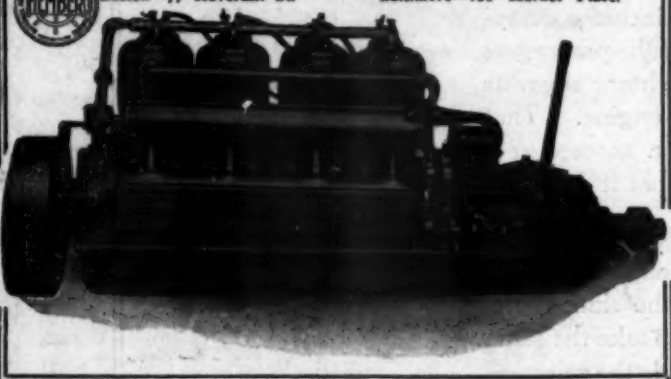
The selection of an engine for your boat is a matter of vital importance to you. The Palmer is the kind of an engine you want. Let us prove it to you. Send today for our New Catalog.

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2 Cylinder, 2 Cycle, 6-8 H. P.

A strictly high grade light weight unit power plant of the two cycle three port type. Two cylinders cast in a block, rated at 6 to 8 horsepower. Weight complete, including reverse gear, magneto and all equipment, only 125 pounds.

Suitable for the Finest Small Boats

For runabouts, tenders, dinghys, canoes, etc. Bearings extra large. Lubrication automatic. Aluminum crank case extended to completely house the "Joe's" reverse gear. Bosch High Tension Magneto and waterproof shock-proof plugs.

\$160.00 COMPLETE, including all equipment, propeller shaft, stuffing box and propeller.

Write for prices on 4 & 6 cylinder motors—Special proposition for agents

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illustrating the various models and sizes of these famous reverse gears will be sent on request.

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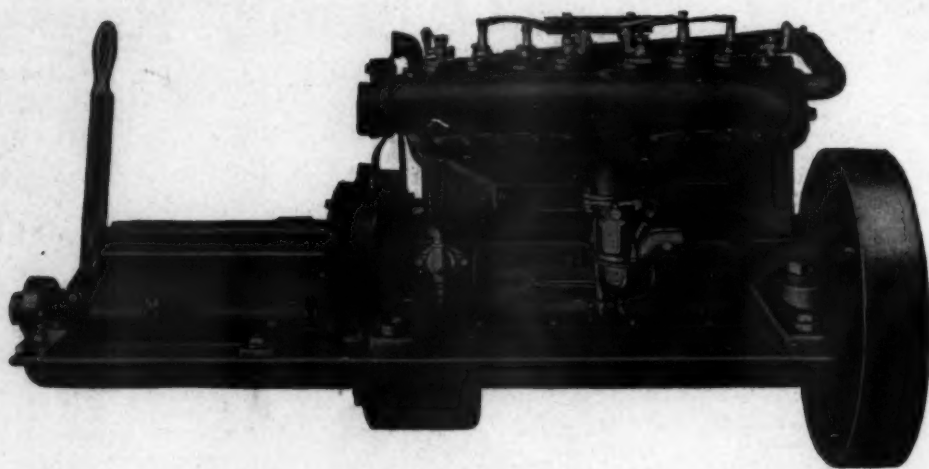
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For the Particular Man who is satisfied with nothing short of the highest excellence.



The keenest and liveliest appreciation of *Kermath* Motors is shown by men who have spent years depending on engines for their "boat power" for the business boat or the pleasure boat.

Every sense of safety and enjoyment he has felt in the operation of other motors, is intensified and he finally lies back when "under power" and feels that something *substantial* and something *supremely* capable of *constant* and *steady* delivery of power is installed in his hull.

He feels that his power plant knows its business and tends to it, *not* requiring constant *personal* attention. The superior qualities of his *Kermath* have been thrust upon him and he realizes that the power delivery can only be the result of *skillful* engineering and *finely* executed mechanical work. The power delivery is steady, quiet and smooth. It is not the jerky, groaning, pounding kind.

That is why it is most keenly appreciated by the real motor expert, and that is why *Kermath* owners and all boat builders so highly endorse the *Kermath* product.

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For You and Your Family This Summer This 30-Foot X-CELO Family Runabout!

A MOTOR-BOAT of style—distinctiveness and extra comfort—a graceful, cleanly craft refined to the last degree of safety and convenience—that's the X-Celo Family Runabout.

This strikingly handsome 30-footer is large enough for any family and can be run by anybody. The best appointed limousine could not offer more real comfort than this new X-Celo model—and no motor car built is as easy to run.

Clean, silent, powerful and *scientifically right in every minute detail of construction*—perfected after a series of tests in the Model Basin at Washington, D. C.,—this beautiful, white-decked thoroughbred offers you everything that can be asked for in a motor-boat. It is the pride of the X-Celo Family—the queen of the line of runabouts which have earned the reputation of being beyond all question, *the finest motor-boats in the world!*

Brief Specifications— X-CELO Family Runabout

Length 30 feet. Beam 6 feet. Guaranteed speed, 17 miles per hour. Capacity, 11 passengers. Engine equipped with electric self-starter, completely installed. Cockpit is exceptionally large, fitted with deep spring cushions and six large, unusually comfortable wicker chairs.

Equipment is Absolutely Complete

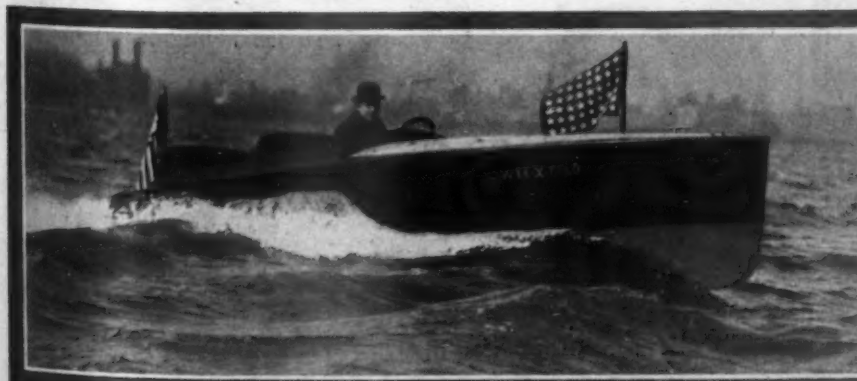
and includes all of the special X-Celo features, i. e., Disappearing Windshield, Divided front seat, deep genuine-leather upholstery, special bronze fittings, One-man Auto Top, full automobile control, Maxim Silencer, Full Light Equipment, Klaxon Horn, etc., etc., etc. No "extras" of any kind to buy.

Early Selection is Advised—Write Now for Catalog and Delivery Schedule.

TO get full measure of enjoyment out of your runabout, you want it ready to launch the day the season opens. If you are at all interested in a pleasure boat of any kind write today for illustrated catalog and schedule of 1915 Delivery Dates. You obligate yourself in no way whatever in asking for full information about any X-Celo model.

In addition to the 30-foot Family Runabout shown above, X-Celo Standard sizes include the following: 33-ft. Mahogany Runabout (9 passengers, 27-30 miles per hour), 28-foot Runabout (7 passengers, 21-33 miles per hour), 26-foot Milwaukee Model (7 passengers, 17 miles per hour), 20-foot Hydro-Runabout (23-35 miles per hour), Wee-X-Celo (shown below) and X-Celo Cruisers (designed chiefly by other naval architects).

Milwaukee Yacht & Boat Co.
343-353 Becher St., MILWAUKEE



Wee-X-Celo

(Speed 13 to 17 Miles per Hour)

\$675⁰⁰ to \$900⁰⁰

"SANDS" MARINE SANITARY FIXTURES

The Finest Assortment of
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Pump Water Closets, Fittings
They Are Built to Last, Used the
Are Guaranteed Without

and Specialties
World Over and
Reserve. Immediate
Shipment from Stock



The "Frisco"—Plate S-2046

(Design Patented—Copyrighted)
The "FRISCO" PUMP WATER CLOSET, extra heavy Vitro-Adamant Oval Hopper Bowl, THREE (3) INCH combined supply and waste pump. All metal parts smoothed. Vitro-Adamant N. P. metal handle with wood grip.
Plate S-2045 Polished oak seat and cover \$59.00
Plate S-2046 Polished oak seat and cover 60.00
Dimensions: Width 24", front to back 21", height 17 1/2". Approximate weight: Net 60 lbs. Shipping 130 lbs.



"IOWA"—Plate S-2040

(Patented—Copyrighted)
The "IOWA" Pump Water Closet has latest style Vitro-Adamant extra heavy oval flushing rim, straight back hopper bowl fitted with four-inch supply and waste pump.
Price with quartered oak, cabinet finish seat and cover; pump rough, with polished trimmings \$85.00



Plate S-127

The "GRABBY" Round Way Sea Cock for use on discharge pipe of closets and lavatories. This sea cock is similar to Plate S-126 except water way, which is full opening and a clear round way.
Price
1 1/2 inch \$4.00
1 1/2 inch 5.50
1 1/2 inch 7.00
2 inch 11.00
2 1/2 inch 16.00



"FLORIDA"—Plate S-2015

(Patented—Copyrighted)
The "FLORIDA" Pump Water Closet has new style extra heavy oval pedestal Vitro-Adamant bowl. Improved supply and waste pump having four (4) inch cylinder. Complete with Mahogany seat and cover. Pump white enameled N. P. trimmings..... \$112.50



"National"—Plate S-2010

(Patented—Copyrighted)
The "NATIONAL" Pump Water Closet has extra heavy Vitro-Adamant Oval Flushing rim Pedestal bowl fitted with 5" combined supply and waste pump. Complete with Mahogany seat and cover. Pump white enameled, N. P. trimmings \$145.00



The "Bow" Closet
Plate S-2050

(Design Patent Applied For.)
The "BOW" CLOSET, Vitro-Adamant Bowl, 2 1/2 in. pump, located at rear, fitted with spring handle. Quick opening supply valve. Space occupied, 18 x 24 in. Pump rough, with finished trimmings, oak seat, N. P. fittings..... \$30.00



"Madison"—Plate S-208

The "MADISON" Vitro-Adamant Lavatory, with overlap slab and integral back, self-closing faucets and china index. "Hot" and "Cold" chain stay with chain and stopper; cast brass N. P. trap, and waste to bulkhead, with..... \$26.00
Dimensions: Slab 20" x 16", basin 14" x 11", back 6" high.



"Knockabout"—Plate S-34

The "KNOCKABOUT" Improved Pump Water Closet, round flushing rim hopper bowl, TWO AND ONE-HALF (2 1/2) INCH supply and waste pump. "Sands" Patent Back Water Check Valve..... \$49.00
Pump rough, finished trimmings. If mahogany seat and cover add \$1.50. Weight: Net, 48 lbs.; Gross, 75 lbs.



"Martius"—Plate S-209

The "MARTIUS" Vitro-Adamant Corner Lavatory, integral back, N. P. brass self-closing faucets, china name plate, hot and cold cast brass waste plug, stopper, chain and chain stay; N. P. half "S" cast brass trap and waste pipe. Dimensions: Length of sides 18 1/2", height of back 6", diameter of basin 14" x 11 1/2". \$27.00



"Winner"—Plate S-2061

(Patented—Copyrighted)
The "WINNER" Pump Water Closet, Vitro-Adamant Bowl, brass hinges, 2 1/2 inch supply and waste pump. "Sands" Patent quick opening supply valve. Plate S-2060. Fittings as described with oak seat. Plate S-2061. Fittings as shown with oak seat and cover..... \$28.00



"Glenwood"—Plate S-150

The "Glenwood" Folding Lavatory, with Vitro-Adamant roll rim tipped oval basin, N. P. copper lining, soap and brush holders. N. P. brass double-acting pump with combination spring supply faucet. N. P. brass towel rack. Quartered oak, polished finish \$42.50. Mahogany, polished finish, add 1.50. Dimensions: Height 20 inches, width 19 inches, depth from back to front when closed 6 inches, when open 18 inches, oval basin 15 inches x 13 inches.



Plate S-3183

The "MANISTON 14" Vitro-Adamant, Flat Back Lavatory, with N. P. Basin Pump and waste fittings, no trap..... \$22.75

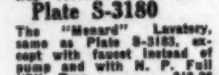


Plate S-3180

The "MANISTON" Lavatory, same as Plate S-3183, except with faucet instead of pump and with N. P. Full "S" Trap..... \$15.25



Plate S-719

Brass Galley Pump, mounted on faucet, handle reversible, outlet adjustable. \$8.00
2 1/2" 13.50
For additional side outlet, add \$1.00. For use in galleys, bunks, etc.



Plate S-4280

Now Pattern Improved All Brass Galley Pump, 2" cylinder with shut-off cock. Pol. Brass \$12.50
Pol. & N. P. 14.00
An efficiency, easy-acting pump used in galley or pantry for supply to basin or sink.



Plate S-3190

The "MONO" 12 in. Vitro-Adamant Corner Lavatory with N. P. Brass Pump and waste fittings and N. P. Full "S" Trap..... \$24.50



Plate S-145

The "HOBROH" Vitro-Adamant Folding Lavatory, N. P. brass combination self-closing faucet for hot and cold water. N. P. brass waste plug and towel rack. Complete, \$40.00. Weight: Net, 45 lbs.; Gross, 75 lbs. Dimensions: Height over all, 20 1/2" width, 18 1/2" in.; depth open, 17 in.; depth closed, 7 in.



Plate S-132 1/2

All Cast Bronze Heavy Pattern Combination Connection, with Strainer and Gears. \$2.25 \$2.00
1" 2.30 2.00
1 1/2" 3.00 2.40



Plate S-750-A

New Style Double-Acting Brass Bilge Pump, with foot attachment and 5-ft. discharge and suction hose with brass strainer.
No. 1—1 1/2" diam., 19" long \$5.50
No. 2—1 1/2" diam., 19" long \$6.50
No. 3—2" diam., 24" long \$14.00



Plate S-1002

Round Flange Competition Monitor A Part with heavy brass frame and hinge.
Diam. of Price Diam. of Price
Opening Plain Opening Plain
6" \$10.75 11" \$17.50
8" 13.00 12" 20.00
10" 14.50 14" 25.00
Larger sizes also made.
PLATE S-1003
Portlight, fitted with storm shutter. Price on application.



"Sands" New
NEW
BILGE
PUMP

The "MACON" Lavatory, same as Plate S-3190, except with faucet instead of pump and without trap..... \$9.25



Plate 130 3/4-B

Cast Bronze Round Strainer, with self-cleaning perforations. Used on water supply for any and all purposes. Flange drilled for 8 screws.
3 1/2" \$6.35 5" \$10.00
3 1/2"50 5" 1.00
4"75 6" 1.25
4" \$3.50 6" \$5.00



Plate S-5202

Universal Polished Brass Hose Lead, Spring Joint permits different angles of Pull—prevents binding of rope. Polished Brass, \$0.35.



Plate S-1001

Round Flange Competition Monitor A Part with heavy brass frame and hinge. Price \$4.50
Plate S-4301 as described and also fitted with adjustable foot rest. \$5.00

Complete line of Closets, Lavatories, Port Lights, and Pumps for Water, Oil and Gasoline, described in New Catalogue "R" free upon request.

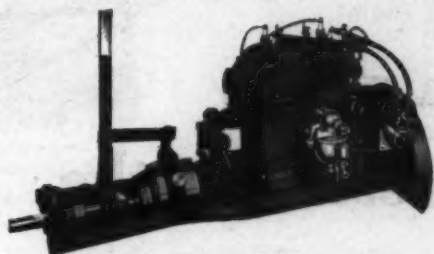
A. B. SANDS & SON COMPANY

Largest Manufacturers in the World MARINE PLUMBING SPECIALTIES 22-24 Vesey St., New York, U. S. A.
1849 — "SIXTY-SIX YEARS OF QUALITY" — 1915

When writing to advertisers please mention MOTOR BOATING, the National Magazine of Motor Boating.

EAGLE ENGINES

This is the Power Plant that has created a new era for the small Speed Boat



MODEL 2-o 12 H.P. Unit Power Plant, consisting of Engine equipped as shown above, with Paragon reverse gear mounted on sub-base, Splitdorf High Tension magneto and special cylinder head for dual ignition. Also double vibrating coil, batteries, switch, high tension and low tension cable with terminals. Hyde manganese bronze 14 x 22 x 3 or 14 x 24 x 3 propeller for high speed, 1 1/4 in. x 6 ft. bronze shaft and stuffing box complete, ready to install, \$280.00.

Dynamometer tests show that this engine develops:

13 H.P. at 700 R.P.M.	16.25 H.P. at 900 R.P.M.
14.3 " " 750	16.75 " " 1000
15.5 " " 800	17.2 " " 1100
15.8 " " 850	17.4 " " 1200

17.5 H.P. at 1300 R.P.M., maximum power

Wonderful for its horse power development.
Wonderful for its high grade construction.

Wonderful for its weight.
Most wonderful for its price.

Stop and consider its value and performance, the Model 2-o EAGLE Engine is the product of the best equipped factory in the world, being made by an organization with more financial responsibility than any other engaged in this line of manufacture, every part of this wonderful motor conforms to our engineer's exclusive formulas. For its bore and stroke we guarantee to develop more horse power than any other two or four cycle engine made.

DURABILITY

The wonderful story of the "Flying EAGLE" boat equipped with a Model 2-o EAGLE reads like a fairy story. On the Atlantic Coast during 1915 it not only defeated all boats in its class, but the larger hydroplane racer equipped with 40 and 50 H.P. four-cycle motors met a like fate. Operating from Atlantic City all during the Eastern Races, it left Norfolk, Va. and has covered every city of note along the Atlantic Coast to Key West and all the cities of the Gulf Coast from Fort Meyers to New Orleans, including races at Tampa, Fla., where it won everything in both the Hydroplane and Displacement classes. Not one cent has been paid for repairs on this motor since leaving the factory one year ago.

The EAGLE line of Engines consists of 19 models in various sizes and styles—a motor for every requirement and at popular prices.

Send a request for our 1915 catalog and see how promptly you receive it. Orders are handled just as promptly.

YOU CANNOT AFFORD TO BUY A TWO-CYCLE ENGINE WITHOUT INVESTIGATING WHAT WE HAVE TO OFFER!

THE STANDARD CO.,

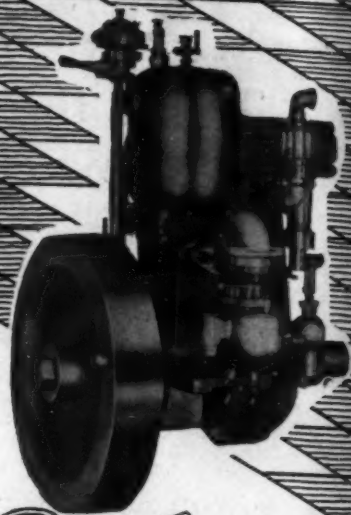
Torrington, Conn.

Distributors for EAGLE Engines

San Francisco, Cal.....The Standard Co., 1028 Geary Street
Los Angeles, Cal.....Marine Equipment Co., 729 So. Los Angeles Street
Seattle, Wash.....The Standard Co., 1628 Broadway
Chicago, Ill.....H. R. Chadwick & Co., 1205 So. Michigan Avenue
Galveston, Texas.....Barden Elec. & Mach. Co., 712 Tremont Street
New Orleans, La.....Stauffer, Eshleman & Co., Ltd., 511 Canal Street
New York City.....Bruns, Kimball & Co., 115 Liberty Street
Cleveland, Ohio.....Motor, Boat & Supply Co., 1411 W. 9th Street
Pensacola, Fla.....

Cincinnati, Ohio.....Motor, Boat & Auto Supply Co., 311 Main Street
Houston, Texas.....Barden Elec. & Mach. Co., 111 Main Street
Baltimore, Md.....Unger & Mahon, Inc., Pratt & Gay Streets
Philadelphia, Pa.....W. E. Gochenaur, 631 Arch Street
Port Elgin, N. B.....C. B. Copp, Copp Block
Montreal, Canada.....Shea Sales Co., 296 St. James Street
Manteo, N. C.....Creff & Jones
W. A. Ray Hardware Co.

Do You Know that
the only
successful two
cycle motor with no
crankcase compression is the



Penrose Motor

Crankcase compression has been the only fundamental source of trouble and inefficiency in two cycle motors—the common fault of all motors of this type.

With crankcase compression successfully eliminated as in the Penrose, the two cycle becomes the most efficient type of motor ever manufactured. Both in theory and practice it excels the best results of all other motors, whether two cycle or four cycle—and we can prove it by demonstration.

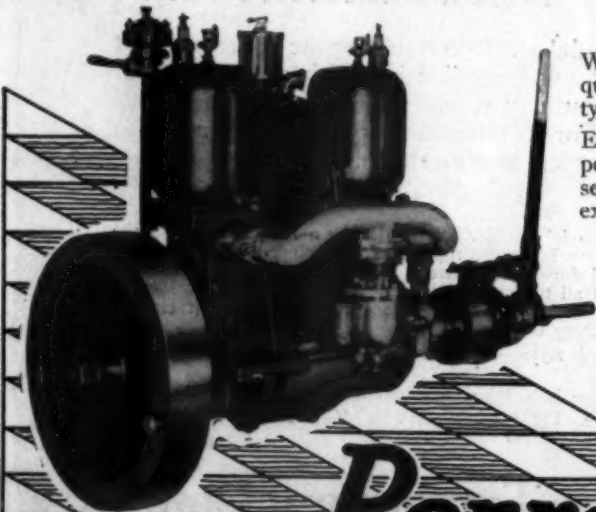
A few marked Penrose advantages:—

Working parts are more easily and quickly accessible than in any other type of motor.

Extreme economy of fuel and very powerful as full expansion of gas is secured, and the usual waste through exhaust prevented.

Unusually durable as lubrication is perfect and the design minimizes wear.

All working parts are enclosed but may be quickly gotten at for adjustment, repair or replacement, without disturbing other parts.



If you want to be well informed on the up-to-date improvements of marine engineering, write us today for literature. Don't wait until you are in the market for a motor. Let us prove Penrose efficiency now. You will be interested in Penrose construction.

Penrose Motor Inc.

1319 Pennsylvania Bldg.
 Philadelphia, Pennsylvania

Write Today



Six New GRAYS

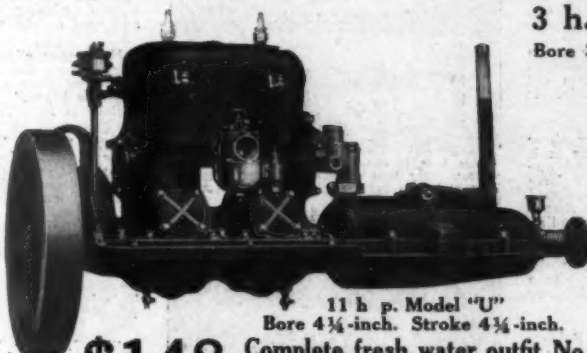
Out This Year



5½ h. p. Model "U"
Bore 4¼-inch. Stroke 4¼-inch.
\$86 Complete fresh water outfit No. 1
Complete salt water outfit No. 3, \$92.50

This 11 h.p. Model "U" has actually pulled 14 h.p. at 1000 R.P.M.; capable of delivering 16 h.p. at higher speed.

Ideal power plant for the popular 16-foot Hydroplane and small runabout—or work boat at lower speeds.



11 h. p. Model "U"
Bore 4¼-inch. Stroke 4¼-inch.
\$148 Complete fresh water outfit No. 1
Complete salt water outfit No. 3, \$160

New Gray 2 CYCLE Features

Complete Unit Power Plant.
Built-in Reverse Gear Enclosed.
Bronze Plunger Pumps.
Cylinder Controls.
Magneto Equipment.
Accessibility—Hand Hole Plates on both sides of crank case.
Non-backfiring Device.
Oversize Connection Rod Bearings.

3 h. p. Model "U" **\$55**
Bore 3½-inch. Stroke 3½-inch
Salt water outfit No. 3, \$59

Three Books Free

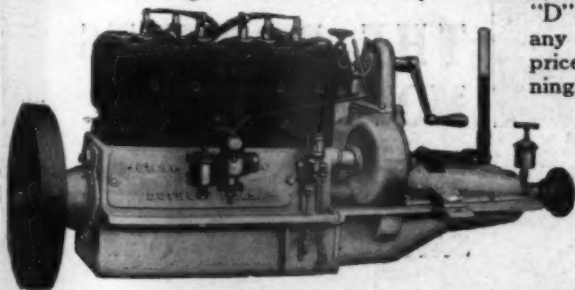
Big marine engine book of 2 and 4-cycle motors. Boat builders catalog—showing where you can buy a boat at the price you want to pay. A book of boats—a guide in selecting hull or engine.

What a Gray Complete Outfit Means

Motor, Pump, Commutator, Krice Carburetor, Relief Cocks, Couplings, Propeller Wheel, Propeller Shafting, Stern Bearing Stuffing Box, National Spark Coil, Champion Spark Plug, Electric Switch, Wire (primary and secondary), Water Scoop, Water Intake Terminal, Gasoline Strainer, Water Strainer, Water Cooled Muffler, Lag Screws, Drain Cocks for Base, Instruction Book. Outfit No. 1 includes Steel Shaft and Iron Propeller. Outfit No. 2 includes Steel Shaft and Bronze Propeller. Outfit No. 3 includes Bronze Shaft and Bronze Propeller—Reverse Clutch and Magneto extra. See our New Catalog.

4 CYCLES

The 2-cylinder "D" is the ideal power plant for fishing boats, work boats, small cruisers and pleasure launches. The 4-cylinder 16 to 20 h.p. "D" is compact and light enough for an 18-footer—speedy enough for a 30-footer—powerful enough for a good-sized cruiser and has the strength and endurance required for a work boat. These Model



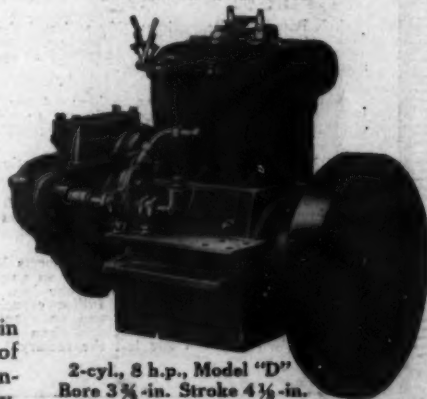
Model "D" 4-Cylinder 16 to 20 h. p.
Bore 3¾-inch. Stroke 4¾-inch.

\$210 and upward depending on equipment



"D" motors know no superior in any other engine, regardless of price, if the power, smooth running, endurance, accessibility, cleanliness, silence and workmanship are considered.

Send for big new catalog, just off the press, showing complete line of Gray 2 and 4-cycle motors



2-cyl., 8 h.p., Model "D"
Bore 3¾-in. Stroke 4¾-in.

\$156 and upward, depending on equipment

Gray Motor Company

574 Gray Motor Building, Detroit, Mich.

ROBERTS

The Motors That Never Backfire

Yes—Its THE Speed Motor—and Reliable

LAST month we told you about the wonderful *Roberts Speed Motors*. This month we present the evidence written and sent in to us by enthusiastic Roberts owners. Before the bar, evidence is supreme. Here is Marine motor evidence that also cannot be disputed.

George H. Farmer, Missouri, writes: "I have a 20 h.p. Roberts Motor. Made 3,000 miles on river last season and never had a backfire—use very little gasoline. I average six miles on one gallon."

C. R. Frisby, Missouri, writes: "I made a run of 120 miles yesterday in seven hours, 60 miles being upstream. At no time during the run did the motor give us the least particle of trouble. It was on the job every second."

R. A. Norman, Ontario, writes: "After three years' constant use I am unable to find any fault with my Roberts Motor. Never having had one minute's trouble during that time while I have towed home boats repeatedly, which are equipped with extensively advertised and supposedly Standard type motors of other manufacturers, including the most prominent on the market."

Henry Hammond, Quebec, writes: "I am delighted with my Roberts Motor. It runs like a watch and starts whenever I want it. All you claim for your motor is fully borne out."

J. W. McCord, W. Va., writes: "My Roberts 10 h.p. motor has done fine work ever since I have had it. Just took it apart and find every part as good as the day I got it. She is so easy to start that I threw the crank handle away. I give the flywheel a half turn and she is off every time. You may not believe it, but I have beaten boats that have 15 and 20 h.p. engines. I have actually run away from them."

E. D. K. Mathews, Omaha, writes: "I have run my 10 h.p. Roberts Motor over 1400 miles through all kinds of weather, on all kinds of water, and it has never failed even once. No difficulty in starting even in freezing temperature. She usually fires on the first turn of the crank."

C. J. Bateman, Ills., writes: "My 10 h.p. Roberts Motor works simply fine. Not a bit vibration going at 12 miles an hour. Never have had as quiet a motor in any of the boats I have had."

Albion Products Company writes: "Our 10 h.p. Roberts Motor on a recent trip ran 12 hours continuously. It has never given us any trouble."

Howard Edwards, Mass., writes: "In a gale of wind from the northeast and the heavy sea yesterday we were the first to reach a 13-ton yacht dismantled off Hedge Fern Light Ship. Several others started but had motor difficulty. The Roberts is most satisfactory."

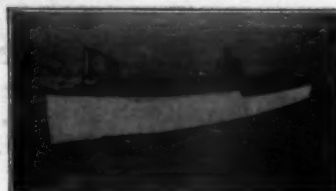
P. C. McAvity, writes: "Used my Roberts Motor the past season about as roughly as an engine could be used, transferred it from one boat to another, and raced her to the fullest capacity. She has never once laid down, and on examining the cranks, etc., this spring, find them in as good condition as when she left the factory."

Agents and Dealers Wanted.

Opportunities to make money, friends and reputations are open to live dealers and agents in a number of good localities. Write for a proposition in your field. Hundreds of motor enthusiasts are looking for a REAL engine with speed. With a Roberts to demonstrate with, you are sure to make money. One sale always makes another, because Roberts owners are always boosters—always inkers for the Roberts. Our proposition will surely interest you.



This boat is owned by Geo. P. Taylor. He writes: "My boat is making 20 full miles an hour and does not make any fuss, as you can see by the picture."



"Sunnyside II," owned by Cliff Hadley, won the free-for-all motorboat race at Ramblersville, Pa., with an 8 H.P. Roberts motor, three years old. He says: "There were boats of 35 H.P. in the race, but a motor that goes and keeps on going the same speed for miles without a miss can win. This is the fourth race I have won out of five starts."



"Valley Scout, Jr.," equipped with Roberts motor, owner Harry E. Miller, writes: "I cleaned up the bunch yesterday, winning a nice big cup and my boat is the talk of everybody around here, on account of the beautiful way it acts and runs."



"Bull Moose," an 18-footer, owned by F. J. Gregory, Morris Heights, N. Y., powered by a 4 cylinder, 40 H.P. Ascolite Roberts motor, 305 lbs. Speed better than 20 miles an hour. Winner of many Atlantic Coast races.

C. F. Sherwin, Canada, writes: "I took first prize in a 45-mile race against quite a number of launches. Your motor ran the whole distance without missing one spark, behaved beautifully, and part of the time was in a very rough sea."

Newspaper clipping, Aberdeen, Wash.: "Henry Dixon drove his 16-ft. motor boat *Swastika* a little faster than 40 miles an hour today on the Chehalis River." Of course, it was equipped with a Roberts Motor.

J. G. Shirley, Texas, writes: "I have a 10 h.p. Roberts Motor in my boat *Surprise* and I must say that it is O. K. The boat is 18 feet long with a 49-in. beam and makes about 17 miles per hour. I am tickled to death with my Roberts Motor."

P. C. deLahaut, France, writes: "We have just finished a 17 days' trip. Your motor ran 7 1/2 hours consecutively. On the last day we started at 7 a.m. and stopped at 3 p.m., then from 4 until 8 o'clock at night and again from 10 to 11. This is a true testimonial to the quality of your motor."

Phil J. Howard & Son, writes: "The Roberts Motor we have is in perfect condition. We could not ask for better results than we are getting. It has been in operation eight months without a breakdown. We just got back from a trip up the Ohio River, out eight days on the crest of the flood. We are holding our own with other motor boats here that have double our power."

Here is an old one to prove that Roberts Motors are not only good now, but have always been good. J. T. Haynes & Son, of Newark, write: "Several years ago we were persuaded to rent a small boat that we had for demonstrating. The price was attractive and led us to put two more boats in livery. Then our troubles began—burned out bearings, etc. (quite a good deal of the latter). We were finally obliged to remove the engines and decided to replace with Roberts. The three boats were in livery during the season of 1910, and were rented to no less than one hundred people, and at the end of the season, upon examination, we found each engine to be practically as good as new. On April 1, 1911, we placed eight more Roberts in our livery, and now, at the end of the season, we were prepared with eleven first class outfits for the coming season of 1912; not one bearing or other vital parts of the engines had to be replaced. We certainly have been 'through the mill' in motorboat livery, and we do not believe there is another motor on the market that would be fit for livery, and we feel that we owe the greater part of our success to the Roberts Motor."

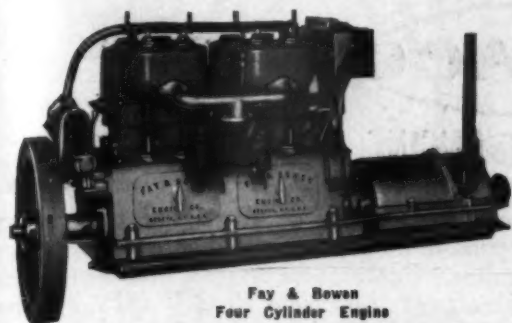
THE ROBERTS MOTOR MFG. CO.

501 Roberts Building

SANDUSKY

OHIO





Fay & Bowen
Four Cylinder Engine



22 ft. Runabout
Speed 20 miles an hour

ADAPTABILITY

These views of different boats powered with Fay & Bowen Engines prove the adaptability of the Fay & Bowen to every type of hull

FAY & BOWEN ENGINES

— ARE —

POWERFUL,
CLEAN,
QUIET,
SIMPLE,
HANDSOME,

and the "last word" in modern mechanical perfection of design and equipment

MADE FOR CANADA BY
St. Lawrence Engine Co., Ltd.
Brockville, Ont.

Fay & Bowen Engine Company
104 Lake St. Geneva, N. Y., U. S. A.



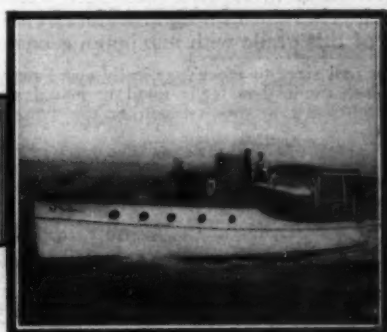
35 ft. Heavy Cruiser
Speed 10 miles an hour



36 ft. Express Cruiser
Speed 20 miles an hour



21 ft. Yacht Tender
Speed 17 miles an hour



40 ft. Heavy Cruiser
Speed 12 miles an hour



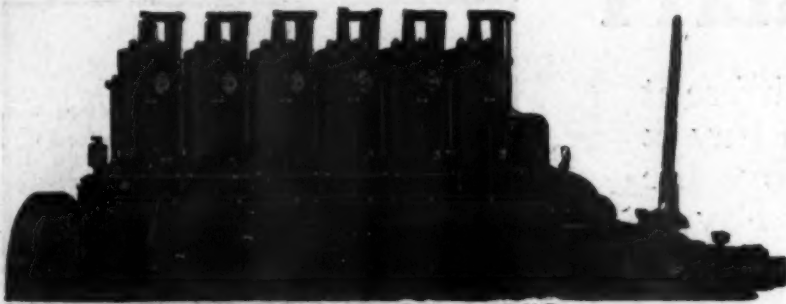
24 ft. Runabout
Speed 16 miles an hour

**ECONOMY
EFFICIENCY****SILENCE
SIMPLICITY**

IF you install a Ralaco Engine in your boat, you can expect uninterrupted power service as long as your boat lasts, with the lowest cost for fuel and maintenance that any engine of any type could give. From a business standpoint, we believe the Ralaco Engines have established by their steady, reliable service the most valuable selling reputation of any power plant built for the same class of work. A Ralaco makes a quiet, clean, cool engine-room. It is the kind of an engine the owner likes to handle

himself—the kind of an engine, too, that you can entrust to an inexperienced assistant without fear of trouble. For cruisers or work boats, in fact any type of craft requiring from 10 to 75 H.P., it is impossible to buy a more satisfactory power plant, or one that will cost less in the long run. Ralaco economy in a couple of seasons pays the difference in cost between a Ralaco and a cheaper engine.

Write to-day for the complete Ralaco catalog



The Six-Cylinder 7 x 9 in. Ralaco. 75 H.P.

**THE S. M. JONES
COMPANY**

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616 Segur Avenue, Toledo, Ohio

Representatives:
POWER BOAT ENGINEERING COMPANY,
136 Liberty Street, New York, N. Y.
A. W. LePage Gasoline Engine & Supply Co.,
Vancouver, B. C.
Geo. W. McNear, Cambria St., Boston

*Powerful
as a Lion*



*Quiet
as a Lamb*

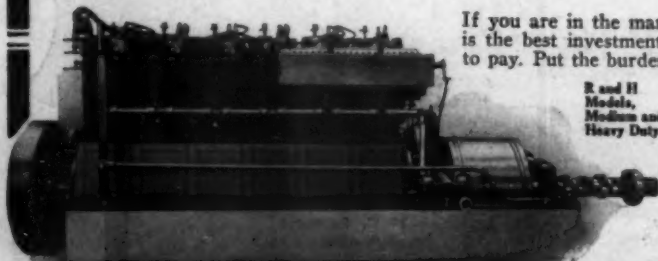
MARINE ENGINES

Medium Duty, Medium Heavy Duty, Heavy Duty, High Speed

The big question to decide in selecting a marine engine is not what price you want to pay but what quality you want to get. If you get an engine of the Lamb quality, you may have to pay a little more at first, but you will save the extra cost many times over during the life of the engine. Nowhere is the economy of real quality more apparent.

A new Lamb Engine is a most conservative power investment, with the element of speculation left out entirely. Its cost represents full value in superior design, materials and workmanship. If you pay less you must get less in return for no manufacturer is better organized and equipped to produce an engine of this grade with maximum economy.

Lamb Engines are built in a variety of distinct types and sizes to meet practically every marine power requirement. Each of these types is designed especially for its own kind of work. Each model has made good in actual service or we would have withdrawn it and redesigned it long before this. When you buy a Lamb you can bank on getting the same quality which has made all Lamb Engines famous.



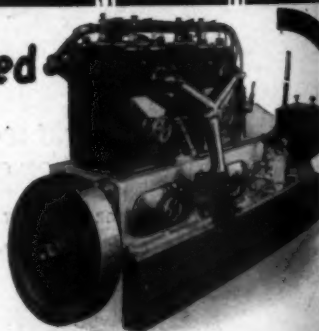
If you are in the market for an engine, give us an opportunity to prove to you that a Lamb is the best investment you can make, no matter what type you want or what price you want to pay. Put the burden of proof on us.

R and H
Models,
Medium and
Heavy Duty

Write to-day for our handsome 40-page catalog.

Eastern and Canadian customers can get quick service through our factory branch at 807 Hudson Terminal Bldg., 30 Church St., New York City. Service Department and Storage Warehouse at 22 Morris St., Jersey City. Engines of all sizes in stock, also repair parts for all models.

LAMB ENGINE CO., Clinton, Iowa, U.S.A.



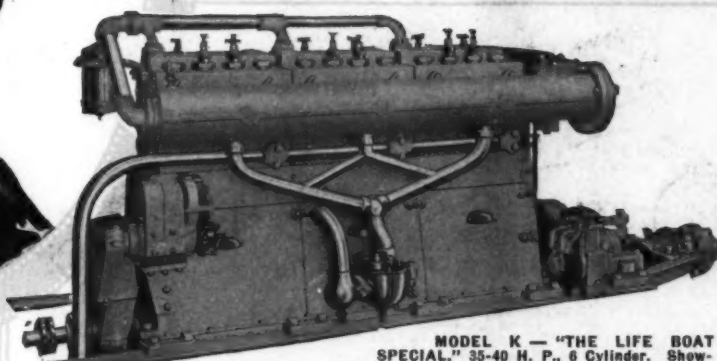
The Lambkin G Model, 4 and 6 Cylinders

HOLMES



*"The Motor
the Life Savers
Use"*

For
Life Boats,
Cruisers,
Work Boats

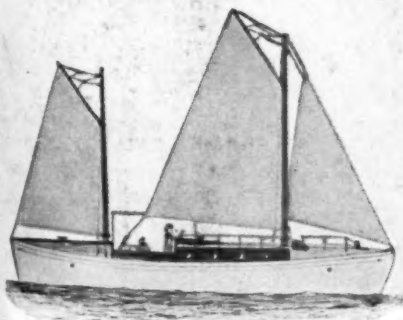


MODEL K — "THE LIFE BOAT SPECIAL" 35-40 H. P., 6 Cylinder. Showing intake pipe to carburetor from within the base. Air is drawn from both ends of engine through the base into this pipe, scavenging the base of all smoke and gases. Should backfire occur it would be through this pipe and could do no harm.

(Over Eighty in the U. S. Coast Guard Service)

Holmes Motors are built for the class of owners who want the *utmost reliability*, in addition to the other good qualities found in all really high grade marine engines. It is certain that no other motor has *proved*, by past results, to be more reliable or satisfactory.

The Holmes is unusually accessible and is built to last for years with minimum expense for fuel and maintenance. It is substantially different, in construction and operating results, from most other high grade motors.



Holmes McLellan Life Boat Cruiser,
built for use at Isle of Pines,
West Indies.

25 H.P., 4 Cyl.
50 H.P., 4 Cyl.

SIZES:

35-40 H.P., 6 Cyl.
75 H.P., 6 Cyl.

100 H.P., 8 Cyl.

Holmes Life Boat Cruisers

Designed along the lines developed for life boat work, these cruisers have been adapted and rearranged to meet the different requirements of pleasure, patrol and commercial work. The unusual life boat safety features do not interfere with comfort or convenience in either type of service. In fact, their design gives an owner more available room.

Non-Sinkable, Self-Righting and Self-Bailing. Speed $9\frac{1}{2}$ miles with 20-25 H.P. Holmes, or about 11 miles with 35 H.P. Holmes Motor. The motor is mounted in an entirely separate fireproof compartment.

Let us send you catalogs of Holmes Motors and Cruisers

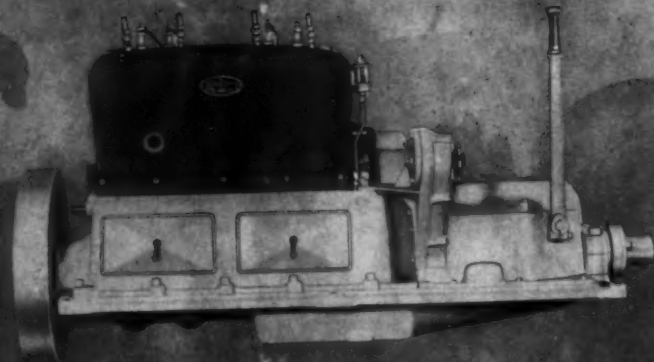
THE HOLMES MOTOR CO., Inc.

50 State Street
Boston, Mass.

WORKS AT WEST MYSTIC, CONN.

Sterling

THE ENGINE of REFINEMENT
For the
finest boats that float



Dependable in Emergencies

We regard as a tribute to the Sterling reputation for reliability and efficiency the selection of the Model E 25 H.P. Sterling for powering the motor lifeboats built by the George Lawley & Son Corp. on a large contract for equipping a well known fleet of ocean liners.

The illustration shows a Lawley lifeboat laden to capacity with 45 men. For such service only a motor of absolute reliability could be employed.

The 25 H.P. Model E will be found a little better, a little more powerful, and a whole lot more reliable than any other motor of its size. Bore and stroke, 3 1/4" x 5 1/4". 17 H.P. at 1200 R.P.M. 25 H.P. at 1300 R.P.M. Built only with aluminum base. Weight, 550 lbs.

It doesn't matter what size or type of boat you have, you owe it the superior service of a Sterling Engine.

Write for details

Sterling Engine Co., 1254 Niagara St., Buffalo, N. Y.



